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PHILIPPINE  
WEATHER  
BUREAU

BULLETIN

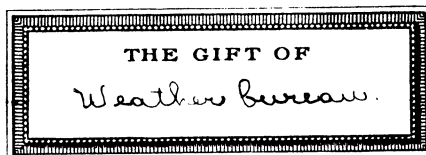
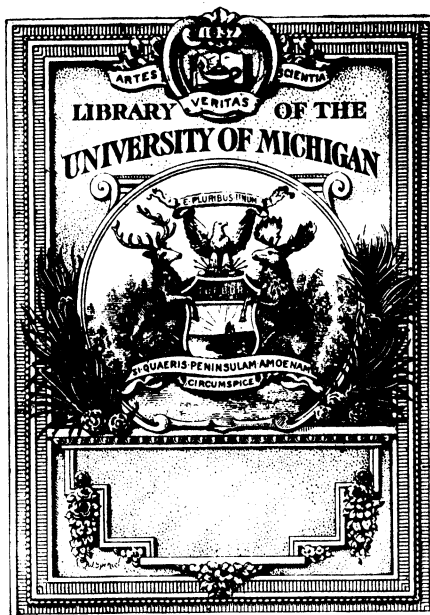
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THE GOVERNMENT OF THE PHILIPPINE ISLANDS

*Philippine Islands*

# WEATHER BUREAU

MANILA CENTRAL OBSERVATORY

MONTHLY BULLETIN  
1913



PREPARED UNDER THE DIRECTION OF

REV. JOSE ALGUE, S. J.  
DIRECTOR OF THE WEATHER BUREAU

MANILA  
BUREAU OF PRINTING  
1913

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## INTRODUCTION.

This year one slight modification is introduced in the BULLETIN. Instead of all the observations from the third-class and rain stations being published as formerly in the BULLETIN of the current month, only the daily rainfall and the daily extremes of temperature for each station will be given in two general tables. The other observations made in these stations will be published later in the annual report.

To facilitate the understanding of the tables of observations published in the meteorological bulletin we beg to remark that the hours of observations for the first and second class stations are 2 a. m., 6 a. m., 10 a. m., 2 p. m., 6 p. m., and 10 p. m. The time used by the observers is that of the one hundred and twentieth meridian east of Greenwich. The barometer readings are corrected for capillarity and temperature and reduced to sea level, but *not* to standard gravity. The correction which is to be applied to the readings as given, whenever it is desired to reduce them to standard gravity, will be found at the head of each meteorological table.

We subjoin a list of all the meteorological stations of the Weather Bureau in operation on January, 1913, together with the names of the respective observers, who must be held largely responsible for the accuracy of the observations published in the bulletins.

### SECONDARY STATIONS AND OBSERVERS OF THE WEATHER BUREAU.

Station.	North latitude.		East longitude.		Observer.	Class.
	°	'	°	'		
Jolo	6	03	121	00	Rufino de la Cruz	III
Isabela, Basilan	6	42	121	58	Inocencio Rodriguez	IV
Zamboanga	6	54	122	05	Francisco Ventus	III
Davao	7	01	125	35	Lamberto Garcia	III
Cotabato	7	13	124	15	Patricio Yabao	III
Cagayan, Misamis	8	29	124	38	Dolorito Contreras	III
Dapitan	8	40	123	25	Florencio J. Castillo	IV
Butuan	8	56	125	32	Generoso Copin	III
Dumaguete	9	18	123	19	Matias Ordiales	III
Yap, Western Carolines	9	29	138	08	Prudencio Z. Urbiztondo	III
Tagbilaran	9	38	123	51	Francisco Burgos	II
Surigao	9	48	125	29	José Sáez	II
Maasin	10	08	124	50	Aguedo Espina	III
Cebu	10	18	123	54	Domingo de los Angeles	I
Iloilo	10	42	122	34	Ricardo A. Luna	I
San Jose Buenavista	10	44	121	55	Teodoro Peñeiro	III
Cuyo	10	51	121	01	Roman Kabigting	III
Ormoc	11	00	124	36	Pedro Baltasar	I
Tacloban	11	15	125	00	Perfecto Paulino	II
Capiz	11	35	122	45	Juan Lugod	II
Borongan	11	37	125	26	Cesáreo Montes	III
Calbayog	12	04	124	36	Segundo Peñaflorida	II
Masbate	12	22	123	36	H. L. Heath	IV
Romblon	12	35	122	16	Pedro M. Asturias	III
Laoang	12	35	125	01	Serafin Alzaga	III
Gubat	12	55	124	08	Victorio Ramos	IV
Legaspi	13	09	123	45	Bernardino Costa	I
Sumay, Guam	13	24	144	38	Herbert Taylor	III
Calapan	13	25	121	11	Aquilino Nokom	III
Virac	13	35	124	14	Eusebio Tali6n	III
Nueva Caceres	13	37	123	11	Eduardo Ongtengco	III

## SECONDARY STATIONS AND OBSERVERS OF THE WEATHER BUREAU—Continued.

Station.	North latitude.		East longitude.		Observer.	Class.
	°	'	°	'		
Batangas	13	45	121	03	Enrico Cabral	III
Atimonan	14	00	121	55	León G. Guintó	I
Silang	14	14	120	58	Marcos Medina	IV
Paracale	14	17	122	47	Benito Peláez	II
Santa Cruz, Laguna	14	18	121	25	Santiago Villaflo	III
Antipolo	14	36	121	10	Valeriano García	IV
Iba	15	20	119	58	Deogracias Tablán	III
San Isidro	15	22	120	53	Bernardo Pecache	II
Tarlac	15	30	120	35	Valeriano Magat	IV
Baler	15	40	121	34	Santiago Palmero	IV
Dagupan	16	03	120	20	José M. Sison	I
Bolinao	16	24	119	53	Ezequiel Reinoso	II
Baguio	16	25	120	36	Leoncio Santos	I
San Fernando, Union	16	37	120	19	Godofredo Resurrección	III
Echague	16	41	121	39	Benito Maramba	III
Candon	17	12	120	26	Luis Quismorio	IV
Vigan	17	34	120	23	Joaquin S. Gallego	II
Tuguegarao	17	36	121	40	José C. de León	II
Laoag	18	12	120	35	Joaquin Ortiz	III
Aparri	18	22	121	38	Manuel Delgado	I
Santo Domingo, Batanes	20	28	121	59	Claudio Castillejos	III

The signs and symbols employed in this publication are the following:

Symbol.	Equal to—	Symbol.	Equal to—
Ci.	Cirrus.	o	Overcast.
Ci.-S.	Cirro-stratus.	p	Passing showers of rain.
Ci.-Cu.	Cirro-cumulus.	q	Squally weather.
A.-Cu.	Alto-cumulus.	u	Ugly or threatening weather.
A.-S.	Alto-stratus.	v	Visibility of distant objects.
S.-Cu.	Strato-cumulus.	w	Wet or heavy dew.
N	Nimbus.	●	Rain.
Cu.	Cumulus.	☁	Fog or mist.
Cu.-N.	Cumulo-nimbus.	b	Dew.
S.	Stratus.	☉	Solar corona.
Fr.-Cu.	Fracto-cumulus.	☾	Lunar corona.
Fr.-N.	Fracto-nimbus.	☾	Lunar halo.
Fr.-S.	Fracto-stratus.	☾	Solar halo.
S.-cf.	Stratus-cumuliformis.	⚡	Heat lightning.
N.-cf.	Nimbus-cumuliformis.	☄	Thunderstorm.
M.-Cu.	Mammato-cumulus.	☄	Thunder without lightning.
b	Bright, clear sky.	☄	Strong wind.
c	Cloudy weather.	☄	Rainbow.
d	Drizzling, light rain.	☄	Dry mist.
g	Gloomy or stormy looking weather.		

NOTE.—A small zero (°) or 2 (°) used as an exponent to the above symbols indicates, respectively, that the intensity of the meteor denoted by the symbols thus affected was small or very great.

## INTRODUCCIÓN.

Introducimos este año una ligera modificación en este Boletín, y consiste en que para las estaciones de tercera clase y de lluvia nos contentamos con publicar dos grandes tablas que contendrán respectivamente la lluvia diaria y las temperaturas extremas diarias para cada una de dichas estaciones. Las demás observaciones se publicarán más tarde en el *report* anual.

Para mejor inteligencia de los cuadros de observaciones que publicamos en el Boletín Meteorológico, téngase presente que las horas de observación para estaciones de primera y segunda clase son 2 a. m., 6 a. m., 10 a. m., 2 p. m., 6 p. m. y 10 p. m. El tiempo seguido por nuestros observadores es el del meridiano 120 Este de Greenwich. Las lecturas barométricas se dan corregidas de capilaridad y temperatura y reducidas al nivel del mar, pero *no* a la gravedad normal. La corrección que por gravedad debe aplicarse, se da al principio de cada cuadro meteorológico.

Damos en el texto inglés una lista de todas nuestras estaciones con los nombres respectivos de los observadores, los cuales son en gran parte responsables de las observaciones que se publican en estos boletines.

Los signos y símbolos usados en esta publicación son los siguientes:

Símbolos.	Significado.	Símbolos.	Significado.
Ci.	Cirrus.	o	Cubierto.
Ci.-S.	Cirro-stratus.	p	Lluvia pasajera.
Ci.-Cu.	Cirro-cumulus.	q	Achubascado.
A.-Cu.	Alto-cumulus.	u	Tiempo feo o amenazador.
A.-S.	Alto-stratus.	v	Traspacidad del aire.
S.-Cu.	Strato-cumulus.	w	Húmedo.
N.	Nimbus.	●	Lluvia.
Cu.	Cumulus.	≡	Niebla o neblina.
Cu.-N.	Cumulo-nimbus.	⊖	Rocío.
S.	Stratus.	⊕	Corona solar.
Fr.-Cu.	Fracto-cumulus.	⊙	Corona lunar.
Fr.-N.	Fracto-nimbus.	☾	Halo lunar.
Fr.-S.	Fracto-stratus.	☼	Halo solar.
S.-cf.	Stratus-cumuliformis.	⚡	Relámpago sin trueno.
N.-cf.	Nimbus-cumuliformis.	⚡	Tempestad de trueno.
M.-Cu.	Mammato-cumulus.	⚡	Trueno sin relámpago.
b	Despejado.	☼	Viento duro.
c	Nublado.	☼	Arco-iris.
d	Llovizna o lluvia ligera.	☼	Niebla seca.
g	Mal cariz; tiempo cerrado, fosco.		

NOTA.—Un ° o un ² puestos como exponentes de los signos, indican respectivamente una muy débil o una muy fuerte intensidad en el meteoro que representan.





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**BULLETIN FOR JANUARY, 1913.**

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# METEOROLOGICAL BULLETIN FOR JANUARY, 1913.

By Rev. JOSÉ CORONAS, S. J.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

**Pressure and temperature.**—The mean atmospheric pressure of the month was less than that of the corresponding month of last year in all the stations of the Philippines. The highest pressures were recorded on the 25th–27th or on the 29th–31st; the lowest on the 7th, 9th, or 10th.

The mean monthly temperature differed but slightly from that of January, 1912, there being but a few stations in the Visayas that give differences greater than 0.5° C. The extreme temperatures in Manila were 31.5 and 18.6° C; the first being registered on the 15th and 22d, and the second on the 29th and 30th.

PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR JANUARY, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from January, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from January, 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		°C.	°C.	°C.		°C.	
Tagbilaran	760.42	−0.88	762.44	26	758.14	2	25.5	+0.1	33.9	5	19.4	17
Surigao	60.26		62.18	27	58.14	7	25.1		32.1	20	18.7	17
Cebu	60.51	−.84	62.39	31	58.34	7	26.5	+ .6	31.5	17	22	29
Iloilo	60.22	−1.17	62.21	26	58.02	2	26.2	+ .7	30.4	17, 22	22.3	13, 16
Ormoc	60.67	−.96	62.56	31	58.55	9	25.8	+1.2	33.1	25	18.8	21
Tacloban	60.83	−1.05	62.98	31	58.72	9						
Capiz	60.89	−1.30	63.34	31	58.70	10	25.7	+ .5	31.8	18	20.5	17
Calbayog	60.78	−1.13	63.02	27	58.81	10	25	+ .5	33.1	25	19.6	14
Legaspi	61.27	−.96	63.88	31	59.03	10	25.9	−.2	32	20, 22	18.4	19
Atimonan	61.65	−.92	64.92	31	59.30	10	25.1	−.5	30.8	16	20.9	13
Paracale	61.91	−.91	65.19	31	59.59	10	25.4	+ .5	30.3	Various	20.5	19
Manila	61.67	−.73	64.38	31	59.38	10	24.7	+ .5	31.5	15, 22	18.6	29, 30
San Isidro	61.84	−.70	64.76	31	59.46	10	24.7	−.1	32.9	21	16.7	27
Dagupan	61.16	−.83	63.95	29	58.65	10	25.7	+ .2	35	23	17	29
Bolinao	61.28	−.68	63.93	29	58.75	10	25.9	−.1	32.6	3	18.1	29, 31
Baguio <sup>a</sup>	638.29	−.44	639.97	25	636.71	7	16.8	+ .3	24.5	3, 4	10.1	28
Vigan	761.38	−.85	764.19	30	758.79	10	25.4	+ .2	32.1	2, 31	17.8	18
Tuguegarao	62.99	−.52	67.58	30	60.06	9	23.3	0	33	4	17.2	29
Aparri	63.21	−.29	68.45	30	60.22	9	23	+ .1	29.5	8	17.4	28

<sup>a</sup> The barometric readings of this station are not reduced to sea level.

**Rainfall.**—If we except Mindanao, the total amount of rain in the rest of the Archipelago was generally greater than during the corresponding month of last year. But comparing the total quantity of rain with the normal values of the month we find that the negative differences almost equal the positive. In Manila the quantity of rain collected in the gauges during the month was 65 mm., which is greater than that of January, 1912, by 43.1 mm., and greater than the normal of the month by 37.2 mm.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF JANUARY, 1913.

Station.	Total.	Departure from January, 1912.	Departure from normal.	Rainy days.	Departure from January, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from January, 1912.	Departure from normal.	Rainy days.	Departure from January, 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.		mm.				mm.	mm.	mm.		mm.		
Jolo	12.6	- 61.2	- 80.8	6 + 2	4.6	29		Legaspi	226.3	+ 148.5	- 151.3	17	+ 2	41.2	9
Isabela, Basilan	54.4	- 53.9	-	7 + 2	39.9	10		Sumay, Guam	15.1	- 35.6	-	4	- 8	5.1	9
Zamboanga	45.5	- 45.3	- 5.7	8 + 2	12.4	31		Calapan	109.2	-	-	19	-	36.1	1
Davao	71.9	- 83.5	- 69.8	3 + 5	53.3	5		Virac	145.4	+ 44.1	-	18	- 6	47.8	12
Cotabato	106.4	+ 57.6	+ 12.9	10 + 3	30.5	22		Batangas	33.5	6.4	-	6	0	12.2	24
Cagayan, Misamis	13.7	7.1	-	5 - 1	4.8	25		Atimonan	268.8	- 179.5	+ 71.9	23	+ 9	73.8	24
Dapitan	246	-	+ 127.6	14	68.6	9		Silang	60.2	- 7.5	-	7	- 4	16	11
Butuan	130.2	+ 33.4	- 51.3	18 + 4	31	8		Paracale	333.1	+ 107.4	-	22	- 1	62.5	11
Dumaguete	72.9	+ 56.3	-	9 + 2	17.2	28		Sta. Cruz, Laguna	104.5	+ 66.7	-	16	+ 1	54.3	1
Yap, W. Carolines	37.3	-	-	13	8.2	5		Manila	65	+ 43.1	+ 37.2	10	+ 5	33.3	1
Tagbilaran	30.2	+ 25.7	- 53.5	7 - 5	18.8	7		Antipolo	107.8	86	-	8	3	77.7	1
Surigao <sup>a</sup>	362.3	+ 129.1	- 27.9	-	104.9	27		Iba	23.2	13.5	-	5	- 2	14.5	10
Maasin	173.2	+ 99.5	+ 34.7	12 + 9	56.9	28		San Isidro	26.9	+ 21.3	+ 10.1	7	- 5	23	1
Cebu	67.8	+ 42.5	- 27.7	16 + 9	17.3	29		Tarlac	11.4	- 12.4	+ 3.9	3	0	6.6	1
Iloilo	40.9	+ 32.9	- 6.7	9 + 2	18.8	10		Baler	224.1	23.2	-	20	+ 4	93.8	1
San Jose Buenavista	7	+ 6.5	-	4 + 3	5.1	10		Dagupan	8.6	5	- 2.1	3	+ 2	6.6	6
Cuyo	.9	+ .9	-	1 + 1	.8	29		Bolinao	46.4	+ 44.1	- 40.9	6	+ 5	29.7	11
Ormoc	142.7	+ 75.2	- 34	14 - 2	61.3	29		Baguio	146.9	+ 144.3	- 109	11	+ 8	92	11
Tacloban	334.8	+ 232.5	-	16 - 3	130.8	29		San Fernando, Union	25.4	25.4	+ 13.2	5	- 5	21.8	6
Capiz	130.1	+ 112.8	- 15.4	18 - 11	23.2	8		Echague	84.8	63.7	-	10	- 1	36	1
Borongan	369.8	+ 173.3	- 102.	22 - 4	130.3	29		Candon	17.5	11.1	-	1	0	17.5	6
Calbayog	190.5	+ 160.5	+ 46.2	19 - 10	29.5	8		Vigan	0	0	- 2	0	0	0	0
Masbate	105.8	+ 76.7	-	13 - 3	55.1	4		Tuguegarao	121.2	+ 92.6	+ 93.5	12	+ 7	77.9	1
Romblon	174.2	+ 107.1	-	16 + 6	54.4	19		Laoag	.8	- 5.9	-	1	- 1	.8	4
Laoang	176.1	+ 80.2	-	23 + 5	39.1	4		Aparri	277.4	+ 92.4	- 60.7	20	+ 7	61.2	18
Gubat	207.1	+ 93.5	-	18 - 5	65.8	1		Sto. Domingo, Batanes	280.6	+ 47.2	-	21	- 4	70.4	3

<sup>a</sup> 30 days of observation only.

## DEPRESSIONS AND TYPHOONS.

During the whole of the month there was no atmospheric disturbance that calls for special mention, at least as far as the Philippines are concerned. A few depression were observed far out in the Eastern Sea, which moved to the E or NE across the Loochoos, and then passed close to the southern coast of Japan; but they had scarcely any influence on the Archipelago, not even on Luzon.

## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes es menor que la del año pasado en todas las estaciones de Filipinas. Las mayores presiones se observaron del 25 al 27 o del 29 al 31. Salvas pocas excepciones, las presiones más bajas ocurrieron los días 7, 9 ó 10.

La temperatura media mensual difiere muy poco de la de Enero, 1912, no habiendo más que unas pocas estaciones de las Visayas que nos den diferencias mayores de 0.5 °C. Las temperaturas extremas para Manila fueron 31.5 y 18.6 °C: la primera se registró los días 15 y 22, y la segunda, los días 29 y 30.

**Precipitación acuosa.**—Si exceptuamos solamente la isla de Mindanao, puede decirse en general que en todo lo restante del Archipiélago la cantidad total de lluvia de este mes es mayor que la de Enero, 1912. Comparando, con todo, esta cantidad total con los valores normales de este mes, hallamos que las diferencias negativas no difieren mucho en número de las positivas. En Manila la cantidad de agua recogida en todo el mes es 65 mm., la cual se diferencia de la lluvia de Enero, 1912, en + 43.1 mm. y de la normal de este mes en + 37.2 mm.

## DEPRESIONES Y TIFONES.

No ha habido en todo el mes ninguna perturbación atmosférica que sea digna de especial mención, al menos por lo que toca a Filipinas. Algunas depresiones se han observado en el Mar del Este que se han movido hacia el E o NE a través de las islas Loochoos, pasando luego cerca de la costa meridional de Japón: pero puede decirse que apenas han influido en nuestro Archipiélago, ni siquiera en la isla de Luzón.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>			
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.				2.50 meters.		Free expo- sure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.						
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.		
1.	761.34	23.9	26.6	22.8	27	27.2	27.9	27.8	28.1	28.2	94.3	20.8	0	0.6		
2	59.76	24.7	30.7	22	26.3	27.3	27.6	27.8	28.2	28.2	89.2	20.4	1.7	1.5		
3	60.02	24.6	30	20	26	27.5	27.5	27.7	28.1	28.3	85.7	19.5	2.4	1.8		
4	60.93	25.2	30.3	21.6	26.4	27.7	27.5	27.8	28.1	28.2	83.5	19.8	2.6	2.1		
5	60.58	25.3	30.4	21.4	26.5	27.8	27.5	27.8	28.1	28.2	82.8	19.6	2.4	2		
6	59.94	24.6	30	21.2	26.6	27.7	27.7	27.9	28.2	28.3	83.6	19.1	2	1.8		
7	59.81	24.5	30.8	19.5	26	27.7	27.6	27.8	28.1	28.2	83.3	18.8	3.1	2.2		
8	60.18	25	30.3	21.7	26.5	27.6	27.6	27.8	28.1	28.2	87.5	20.4	1.4	1.4		
9	59.49	25.7	30.8	20.9	26.4	27.9	27.6	27.9	28.1	28.2	84.1	20.4	3.3	2.2		
10	59.38	25.2	29.9	23.5	27.3	28.1	27.8	28	28.2	28.3	89.1	21.2	.8	.9		
11	60.16	24.8	28.5	22	27.1	27.6	27.8	27.9	28.1	28.2	87.7	20.3	1.5	1.4		
12	60.52	24.2	29	21.2	26.7	27.5	27.8	27.8	28.1	28.2	86.6	19.4	3.6	3.1		
13	60.95	25.4	30.9	21.4	26.7	27.9	27.7	27.8	28.1	28.4	80.7	19.2	2.9	2.3		
14	61.24	24.8	31.2	20.2	26.6	28	27.7	28	28.1	28.2	82.7	19.1	2.9	2.2		
15	61.85	25.4	31.5	20.6	26.6	28.3	27.8	28	28.1	28.4	81.5	19.5	3.2	2.2		
16	61.93	26	31.1	21.6	26.9	28.4	27.9	28.1	28.1	28.2	82.2	20.3	3	2.2		
17	61.18	26.2	31.4	23.2	27.2	28.6	28	28.2	28.1	28.2	83	20.7	3.4	2.6		
18	61.38	25.3	30.8	21.3	27.3	28.4	28.1	28.3	28	28.2	79.2	18.8	3.5	2.9		
19	61.42	24.5	30.3	20.1	26.7	28.3	28.1	28.2	28.1	28.2	79.3	18	3.1	2.4		
20	61.60	24.6	30.4	20	26.6	28.2	27.9	28.2	28	28.2	80.8	18.4	2.9	2.1		
21	61.59	25.4	31	21.3	26.2	27.9	28	28.2	28	28	81.8	19.5	3.1	2.6		
22	62.06	25.5	31.5	22	27	28.4	28	28.3	28	28	78.2	18.7	3.2	2.6		
23	62.51	25.1	31.3	21	26.8	28.5	28.1	28.3	28.1	28.2	79.1	18.5	3.7	2.7		
24	62.76	24.7	29	23.1	27.6	28.3	28.2	28.3	28.1	28.2	87.5	20.2	.7	1.1		
25	63.88	24.2	28.1	22	27	27.6	28	28.1	28.1	28.2	89.8	20	.7	1		
26	63.99	24.4	29.7	21.1	26.6	27.5	27.8	27.8	28.1	28.2	79.4	17.8	2.8	2.6		
27	64.08	23	29.2	19.3	25.7	26.7	27.5	27.6	28	28	75.9	15.7	2.8	2.4		
28	64.27	22.9	29.7	18.9	25.1	26.6	27	27.3	28	28	72.7	14.8	3.2	2.7		
29	64.14	22.8	28.7	18.6	24.8	26.5	26.9	27	28	28	81.3	16.7	1.3	1.5		
30	64.36	23.7	30.4	18.6	24.7	26.6	26.8	27	28.1	28.1	77.6	16.6	3.5	2.9		
31	64.38	24.3	30	21	25.4	26.7	26.8	26.8	28.1	28.3	74.8	16.7	4	3.5		
Mean	761.67	24.7	30.1	21.1	26.5	27.7	27.7	27.9	28.1	28.2	82.7	19	2.5	2.1		
Total													78.7	65.5		
Departure from normal	+0.58	-0.2	0	+0.7							+4.6	-0.8				

Day.	Wind.				Clouds.		Sun- shine.	Rain, 24 hours beginning mid- night.	Miscellaneous.		
	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.	Amount (mean).	Form and its direction.					
						Upper.				Lower.	
1	N	Km. 168	Km. 20	N	0-10.		Cu.-N.	E	h. m.	mm.	● a. p.
2	NW	119.5	15	NW	6.2	A.-Cu.	Cu.	ESE	4 55	2.1	● a.
3	NE, WSW	82	10	WSW	7.1	Ci.-S.	Cu.	E	4 50		
4	Variable	121.5	13	SE	9.4	A.-Cu.	Cu.	ESE	2 20		
5	NE	107.5	10	NNW, ENE	7.8	Ci.	Cu.	E	3 10	.3	d° a. p.
6	NE quad.	120	13	E	9.2	Ci.-S.	Cu.	E	1 35	1.8	● a.
7	WSW	107.5	11	WSW	5.2	Ci.-S.	Cu.	SE	6 35		
8	NE quad.	44	6	NE	8.3	Ci.-S.	Cu.	E	0 40		
9	WNW, SE	90.5	13	WNW	7.8	Ci.	Cu.	E	6 15		
10	N quad.	52.5	14	NW	9.8	A.-Cu., Ci.-S.	Cu.-N.	E	0 55	.9	●° a. p.
11	NNE	95	16	NE	9.9	Ci.-S.	N.-cf.	E	0 00	.3	d° a. p. ↑ p.
12	WNW	62	9	WNW	8.2	A.-Cu.	Cu.-N.	E	2 15		d° p.
13	NE, WNW	117.5	13	WNW	4.3	Ci.	Cu.	E	8 10		
14	SE	118.5	14	WNW	4.2	Ci.	Cu.	E	7 45		
15	NE, W	116.5	14.5	W	3.9	A.-Cu.	Cu.	E	7 10		
16	WNW	78	11	WNW	2.7	Ci.	Cu.	E	7 50		
17	W quad.	150	17	WSW	3.8	A.-Cu., Ci.	Cu.	E	7 25	2.3	d° ●° a.
18	W quad.	201.5	16	WNW	6.8	Ci.	Cu.	E	7 05		
19	NE, WNW	168.5	15	WNW	5.1	Ci.	Cu.	E	7 40		
20	W quad.	94.5	11	WNW	2.5	Ci.	Cu.	NNW	8 10		
21	WNW	99	13	WNW	4.7	A.-Cu.	Cu.	E	5 30		
22	NNE, SE	101.5	13	WNW	5.6	Ci.	Cu.	E	8 00		
23	W, NNE	104	14	W	5.8	Ci.	Cu.	E	6 35		
24	Variable	55	7.5	NNE, NNW	9.9	Ci.-S.	Cu.-N.	E	0 10	12.7	● a. p.
25	N quad.	69.5	10.5	NNW	9.4	Ci.-S.	N.-cf., Cu.-N.	E	1 35	10.4	p a. ● p.
26	NNE	145	21	NNE	8.7	A.-Cu.	Cu.	ENE	1 55		
27	E	163	13	W	6.2		N.-cf.	NE	4 20		
28	NE quad.	110.5	12	WSW	3.6	Ci., A.-Cu.	Cu.	ENE	7 00		
29	N quad.	49	6	WNW	9.7	A.-Cu.	Cu.-N.	E	1 40	.9	● p.
30	E	85.5	10	NNE, E	7.9	Ci.	N.-cf.	ENE	4 00		
31	ENE	166.5	21	ENE	7.6	Ci.	Cu.	E	5 00		
Mean		108.5	13		6.8			4 32			
Total		3,363.5						140 30		65	
Departure from normal		-1,774.0			+1.5			-51 24		+37.2	

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.

METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.<sup>a</sup>

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied,  $-1.86$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	759.15	25.8	31.3	23	83.3	20.4	NE	1	6	Ci., Ci.-S.	Cu.	E		
2.	58.14	25.8	32.3	21.8	81.3	19.8	Variable	.7	3.8	Ci.	Cu.	SE, SSE		
3.	58.47	25	32.6	20.7	84.3	19.8	NE	.8	3.2	Ci.	Cu.	E		d° p.
4.	59.06	27	32.9	23.5	81.3	21.3	E, ENE	.5	6	Ci., Ci.-S.	Cu.	SE	1.5	d° a.
5.	58.76	26.8	33.9	22.3	72.8	18.5	E	1.3	3.5	Ci.	Cu.	SE		
6.	58.20	26.5	31.3	22.2	77	19.7	E	1.3	5.8	Ci.-S.	Cu.	SE	2.5	● a.
7.	58.22	25.4	30	23.3	85.8	20.6	NE	1.2	8	Ci.-S.	Cu.	SE	18.8	d° a. ● a. p.
8.	58.88	26.1	30.9	22.4	82.2	20.6	E, NE	.3	6.2	Ci.-S.	Cu.	ESE	d° p.	
9.	58.22	26.3	31.6	23.2	86.5	21.9	E	1	5.7	Ci.-S.	Cu.	E, ESE	1.5	p° c.
10.	58.32	26.8	33.5	21.2	79.5	20.4	E	1.5	2.5	Ci.	Cu.	SE		
11.	59.11	25.4	31.3	20.2	77.5	18.5	SE	1	2.8	Ci.	Cu.	SE, SSE		
12.	59.52	25.1	32.4	20.4	75	17.4	SE	1.7	2	Ci.	Cu.	SSE		2° p.
13.	60.19	25.2	32.3	19.8	76.5	17.9	E	1.8	1.7	Ci.	Cu.	SSE		
14.	60.54	24.8	30.6	21.4	82.3	19.1	SE	1.2	3.3	Ci.	Cu.	SSE		d° a.
15.	61.32	25.2	31.4	20.8	81.3	19.2	SE	1.8	2.8	Ci.	Cu.	SSE, SE		
16.	61.70	25.1	31.8	20.6	79.3	18.4	E	1.2	2.3	Ci.	Cu.	SSE, SE		
17.	60.99	24.7	31.3	19.4	79.7	18	SE	1.3	1.8	Ci.	Fr.-Cu.	SE, SSE		1° 2° p.
18.	61.25	25	30.6	20.2	80.8	18.7	E	1.8	4	Ci.-S.	Cu.	SE		
19.	61.04	25.2	31.7	21.3	81.3	19.1	SE	1.3	5.3	Ci.-S.	Cu.	SSE		2° p.
20.	61.37	25.9	31.9	20.5	76.7	18.6	E	1.3	2.7	Ci.	Cu.	SE		
21.	61.28	25.9	31.7	20.4	79.8	19.7	SE quad.	1.2	3.3	Ci.	Cu.	E		
22.	61.32	26.1	32.2	22	79.8	19.8	SE	1.3	4.3	Ci.-S., Ci.	Cu.	SSE		
23.	61.33	26.2	32.7	21.2	74.7	18.5	SSE	1.2	3.2	Ci.	Cu.	SSE		
24.	61.32	24.8	31.8	20.1	80.7	18.5	E	1.7	2.8	Ci.	Cu.	SE		d° p.
25.	61.86	26.1	33.6	20.6	73	17.9	E quad.	2	1.7	Ci.	Cu.	SE		
26.	62.44	24.2	31.7	21	81.7	18.1	E	1.7	4.5	Ci.	Cu.	SE		d° a. p.
27.	62.14	25.6	32.3	21	73.2	17.4	E	3	5.7	Ci.-S.	Cu.	SE		d° a.
28.	62	24	29.6	21.6	88.5	19.5	NE	2.8	9.8	Ci.-S.	Fr.-N.	E	1.3	d° a. p p.
29.	62	24.3	27.9	20.9	86	19.4	NE, NNE	2.5	9.3	Ci.-S.	Cu.	E	2.8	●° a. d° p.
30.	62.35	24.9	29.6	22.1	84.3	19.6	E	1.3	8.8	Ci.-S.	Cu.	SE	d° a.	
31.	62.42	24	30	20.5	87	19.2	NE	1.3	6.3	Ci.-S.	Cu.	SE, E	1.8	d° a. ●° p.
Mean	760.42	25.5	31.6	21.3	80.4	19.2		1.4	4.5					
Total													30.2	

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied,  $-1.86$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	758.95	25.8	28.5	24.3	91.2	22.4	E	299.1	5.3		N.	E	13.8	● d a.
2.	58.34	26.3	30.8	22.8	83.3	21	ENE	257.2	2.3	Ci.	Cu.-N.			● a.
3.	58.44	26.8	31.3	24				243.3						
4.	59.34	24.6	29.6	22.6	89.2	21.3	E	158.9	b10	Ci.-S.	Cu.-N.	E, ESE	20.6	● a. p.
5.	58.82	26.4	30.3	22	75.5	19.3	E	423.7	8.3	Ci.-S.	Cu.-N.	ESE	3	d° a.
6.	58.31	25	29.8	20.8	86.5	20.3	E quad.	317.1	8	Ci.-S.	Cu.-N.	E	2.5	d° a.
7.	58.14	24.8	27.1	22.3	92.8	21.6	E	209.5	9.8	Ci.-S.	Cu.-N.	ESE	13.9	d° a. ● p.
8.	58.74	25.5	30.4	22.3	90.8	22	E quad.	222.7	9.8	Ci.-S.	Fr.-N.	ESE	6.9	● a. p.
9.	58.32	26	29.4	22.9	87	21.5	E	138.5	9.3	Ci.-S.	Cu.-N.	ESE	6.6	● p.
10.	58.52	25.9	30	21.8	85.5	21	E	265.1	5.5	Ci.-S.	Cu.-N.	E, ESE	5	d° a.
11.	59.23	25.5	31	20.7	81.3	19.4	E	221.7	2.7	Ci.-S.	Cu.-N.	ESE	2 a.	
12.	59.60	25.4	31.6	19.9	77.7	18.4	ENE	258.2	3.3	Ci.-S.	Cu.	ESE	2 a.	
13.	60.11	25.3	31	20.1	86.5	20.6	ENE	273.3	4	Ci.-S.	Cu.	E	6.6	● a. ● p.
14.	60.38	25.2	31.7	20.8	83.5	19.6	ENE	184.9	4.7	Ci.-S.	Cu.-N.	NE		●° a.
15.	61.05	24.5	31.7	19	85.3	19.4	ENE	141.2	2.7	Ci.-S.	Cu.	NE	2 a.	
16.	61.21	24.6	30.9	19.6	83.3	19.1	ENE	156	3.7	Ci.-S.	Cu.	NE		
17.	60.84	24.4	31.1	18.7	82.5	18.6	ENE	163.9	2.2	Ci.-S.	Cu.	NE		a.
18.	60.72	24.6	30.9	18.8	84.5	19.4	NNE	162.9	3.2	Ci.-S.	Cu.	NE		a.
19.	60.78	25.4	31.2	20.4	83.3	20	NNE	190.1	3	Ci.-S.	Cu., Cu.-N.	NE		° a.
20.	61.25	24.2	32.1	20	88.7	20	NNE	180.5	4.8	Ci.-S.	Cu.-N.	NE	2.8	d° a. d p.
21.	61.16	23.1	29.3	19.1	90.5	19.3	NNE	138.4	4.3	Ci.-S.	Cu.-N., Fr.-N.	NE	9.4	d p.
22.	61.24	24.8	31.5	19.7	87.5	20.3	ENE	225.8	3.3	Ci.-S.	Cu.	E	3	● a.
23.	61.34	25.4	30.5	20.8	86	20.6	ENE	273.5	3.2	Ci.-S.	Cu., Cu.-N.	NE	3.8	● a. p.
24.	61.01	26.7	30.9	21.7	79.5	20.4	ENE	322.7	4.5	Ci.-S.	Cu., Cu.-N.	NE	8	d° a.
25.	61.37	25.1	30.8	20.3	84	19.8	ENE	357.2	4	Ci.-S.	Cu., Cu.-N.	NE	3	d° a.
26.	62	25.8	30.2	22.1	80.7	19.7	ENE	438.5	7	Ci.-S.	Cu.-N.	NE	17.8	d a. ● p.
27.	62.18	23.5	25.9	21.8	90.8	19.5	ENE	441.3	9.5	Ci.-S.	Fr.-N.	NE	104.9	● a. ● d² p.
28.	61.46	23.7	27	21.1	91.7	19.9	NE	376.6	10	Ci.-S.	Fr.-N.	ENE	29.7	●² a. ● d² p.
29.	61.58	23.9	28	20.7	88.5	19.5	N	206.3	9.2	Ci.-S.	Fr.-N.	ENE	69.2	● a. p.
30.	61.77	24.8	26.3	22.4	85.7	19.8	E	495	10	Ci.-S.	N.	ENE	16.3	●² a. d p.
31.	61.80	26.1	29.8	21.7	78.3	19.5	E	555.9	10	Ci.-S.	Cu.-N., Fr.-N.	ENE	34.6	d² a. p.
Mean	760.26	25.1	30	21.1	85.4	20.1		267.7	5.9					
Total								8,299					362.3	

<sup>a</sup> All the mean values given in these tables are deduced from six daily observations.<sup>b</sup> Deduced from four observations only.<sup>c</sup> 30 days of observation.

## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Temperature.				Relative humid- ity (mean).	Vapor pressure (mean).	Wind.			Clouds.		Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.	
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total move- ment in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.		
1.	759.33	26.7	29.5	24.5	79.3	20.5	NE	355.8	4.8	Ci.	Cu., Cu.-N.	E	1.3	☉ a. p.
2.	58.49	26.5	28.8	24.2	74.2	19.1	N	372.4	4	Ci.	Cu.-N.	NE	1	☉ a.
3.	58.54	27.2	30	24.5	76.2	19.5	NE	315.4	5.2	A.-Cu.	Cu., S.-Cu.	ENE	1	☉ a. p.
4.	59.34	26.9	29.5	24.5	80.5	21.2	NE	371.2	7	Ci.-S.	Cu.-N.	NE	2.5	☉ a. p.
5.	59.04	27.2	30.7	23.5	77.5	20.6	NE quad.	402.9	5.7	Ci.	Cu., S.-Cu. NE	ENE	1.3	☉ a. p.
6.	58.63	26.6	29	23.2	72.7	18.6	NNE	338.6	5	Ci., Ci.-S.	Cu.	NE		☉ a.
7.	58.34	25.9	28.1	23.6	82.5	20.6	NNE	332.3	7.8	Ci.-S.	Cu.-N.	NE	13.7	☉ a. p.
8.	59.16	26.2	29.2	24.2	82.5	20.8	NNE	319.8	7.3	Ci., Ci.-S.	Cu.-N.	NE	1	☉ a. p.
9.	58.39	27.3	30.4	24.4	79.2	21.3	NNE	281.9	5.8	Ci.-S.	Cu.	ENE	3	☉ a. p.
10.	58.57	27.2	29.5	24.1	77.2	20.6	NE	354.8	4.2	Ci.	Cu.	ENE		☉ a.
11.	59.37	26.7	29	24	71.3	18.5	NE, N	313.8	3.3	Ci.	Cu.	E		☉ a. p.
12.	59.86	26.2	28.6	23.8	66.7	16.8	NE	346.9	2.8	Ci.	Cu.	E		☉ a. p.
13.	60.37	26.6	29.8	23.5	71.8	18.4	NE, N	278	3.2	Ci.	Cu.	E		☉ a.
14.	60.67	26.4	29	24.3	71	18.2	N	246.3	3.3	Ci.	Cu.	E, ENE	.3	☉ a. p.
15.	61.51	26.8	29.9	24.4	71	18.4	NE	240.7	3.8	Ci.	Cu.	ENE	.8	☉ a. p.
16.	61.68	26.8	29.8	23.4	69.2	18	NE, N	241.9	3.2	Ci.	Cu.	ENE		☉ a.
17.	60.96	26.7	31.5	23.3	63.5	16.4	NE quad.	199.7	2.8	Ci.	Cu.	E		☉ a.
18.	60.96	27.1	30	24.6	72.8	19.4	NE, N	204.6	5.3	Ci., Ci.-S.	Cu.	ENE		☉ a.
19.	60.88	27	30.6	23.9	71.2	18.7	NE quad.	234.6	3.3	Ci.	Cu.	ENE		☉ a. p.
20.	61.23	27	30.3	23.5	76.2	20	N, NE	262.7	2.8	Ci.	Cu.	ENE		☉ p.
21.	61.21	27	30.5	23.4	71.7	18.7	NE quad.	257.1	3.7	Ci.	Cu.	ENE	1	☉ a. p.
22.	61.35	27.1	30.4	24.8	71.2	18.8	NE, N	281.3	4.7	Ci.	Cu.	ENE		☉ a. p.
23.	61.51	26.4	30.4	23.8	73.5	18.5	NE	376.6	4	Ci.	Cu.	ENE	1.3	☉ a. p.
24.	61.49	26.4	29.5	24	71.8	18.3	N	355.8	2.8	Ci.	Cu.	ENE		☉ a.
25.	61.90	27.1	31	23.5	66.5	17.4	NE	439.4	3	Ci.	Cu.	ENE		☉ a. p.
26.	62.35	26.3	29.6	22.6	74	18.7	N	457.5	4.5	Ci.	Cu.	NE	6.8	☉ a. p.
27.	62.10	26.3	29.5	23.4	66.5	16.7	N	612.1	5.2	Ci.	Cu.	ENE		☉ a.
28.	61.81	25.8	29	22.8	71.5	17.5	N	643.9	7.7	Ci.	Cu.-N.	ENE	12.2	☉ a. p.
29.	62.20	23.9	25.2	22	87	19.2	NE	480.4	9		N.	ENE	17.3	☉ a. p.
30.	62.28	25.4	27	23.1	81.5	19.6	NE quad.	418.4	8	A.-Cu.	Cu.-N.	NE	2.3	☉ a. p.
31.	62.39	25.3	27.5	22.8	78.7	18.8	N, NE	478.9	5.5	Ci., A.-Cu.	Cu., S.-Cu.	ENE	1	☉ a. p.
Mean	760.51	26.5	29.4	23.7	74.2	19		348.9	4.8					
Total								10,815.7					67.8	

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Form and its direction.					
									Upper.		Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.	Km.	0-10.					mm.	
1.	758.98	27	29.8	24.4	79	20.7	N, NE	495	4.3	A.-Cu.	Cu.			☉ a. p.
2.	58.02	27	30	24.1	73.7	19.2	NE	523.2	4	Ci.-S., A.-Cu.	Cu.	NE		☉ a.
3.	58.30	26.3	28.9	24	80.2	20.3	NE quad.	387.4	6.5	Ci.-S.	Cu.-N., Cu.		0.8	☉ a. p.
4.	58.86	25.8	27.7	24.7	88.2	21.8	N, NE	464.4	7	Ci.-S.	Cu.-N.		4.1	☉ a. p.
5.	58.76	26.2	29.6	24.3	80.5	20.3	N	560.9	6.2	Ci.-S.	Cu.			☉ a. p.
6.	58.50	25.6	28.6	23.7	80	19.4	N	444.9	7.2	Ci.-S.	Cu.-N.	NE		☉ a. p.
7.	58.38	25.8	28.2	24.3	82.2	20.2	N	486.6	6.5	Ci.-S.	Cu.-N.	NE		☉ a. p.
8.	58.75	26.7	29.3	24.2	78.8	20.4	N, NE	434.3	5.7	Ci.-S.	Cu.			☉ a. p.
9.	58.27	27.3	30.2	25.1	78.5	21.1	N, NE	397.1	4.7	Ci.-S.	Cu.	NE	2.3	☉ a. p.
10.	58.15	26.4	29.1	24	80.8	20.5	NE	390.2	6.5	Ci.-S.	Cu.		18.8	☉ a. p.
11.	58.81	26.3	29.3	23.9	70.8	17.8	N, NE	439.9	2	Ci.	Cu.			☉ a.
12.	59.46	25.5	29	22.7	69	16.5	NE	453.2	2.7	Ci.	Cu.			☉ a. p.
13.	59.96	25.6	29.2	22.3	70.2	17	N, NE	391.3	3.2	Ci.	Cu.			☉ a. p.
14.	60.30	26.2	29.6	22.8	69.7	17.6	NE quad.	336.6	2.5	Ci.	Cu.	NE		☉ a. p.
15.	61.06	26.3	29.9	22.6	72.7	18.4	NE	328.1	2.5	Ci.	Cu.			☉ a. p.
16.	61.39	26.2	30	22.3	71.2	17.8	NE quad.	285.3	1.8	Ci.	Cu.			☉ a. p.
17.	60.73	26.3	30.4	22.6	67	16.7	NE quad.	280.8	2.8	Ci.	Cu.	ENE		☉ a. p.
18.	60.71	26.4	29.9	23	70.2	17.9	NE	249.7	3.5	Ci.	Cu.			☉ a. p.
19.	60.49	26.3	29.2	23	73	18.5	N, NE	405.8	1.8	Ci.	Cu.		1.3	☉ a. p.
20.	60.79	26.7	30.3	24.1	72.5	18.7	N, NE	310.7	5.2	A.-Cu.	Cu.			☉ a. p.
21.	60.71	27.1	30.2	24.3	71	18.6	N, NE	340.2	1.3	Ci.	Cu.			☉ a. p.
22.	61.03	27	30.4	23.8	68.7	18	NE	409.8	3.3	Ci.	Cu.			☉ a. p.
23.	61.13	26.3	29.4	23.7	74.7	18.9	NE	541	2.8	Ci.	Cu.	NE	2.8	☉ a. p.
24.	61.02	26.6	29.9	23.9	72.7	18.4	N, NE	426.2	5.5	Ci., A.-Cu.	Cu.	NE	3.2	☉ a. p.
25.	61.71	26.6	29.5	23.9	71.8	18.5	NE	456.9	4.3	Ci.-S.	Cu.	NE		☉ a. p.
26.	62.21	26.2	29.2	22.9	76.3	19.1	NE	546.9	4.5	Ci.	Cu.			☉ a. p.
27.	62.19	25.2	28	22.6	75.5	17.8	NE	664.4	5.5	Ci.-S.	Cu.-N.	NE	1	☉ a. p.
28.	62	24.9	28	22.4	71	16.6	NE	585.3	5.3	Ci.-S.	Cu.		2	☉ a. p.
29.	62.02	24.8	27.5	23.2	79.5	18.4	N, NE	522.1	8.3	Ci.-S.	Cu.-N.		2.5	☉ a. p.
30.	62	25.6	28.4	23.7	75.5	18.3	N, NE	637.3	6.8	Ci.-S.	Cu.	NE		☉ a. p.
31.	62.07	25.8	28.9	22.8	76	18.6	N, NE	660.2	4.5	Ci.	Cu.	NE		☉ a.
Mean	760.22	26.2	29.3	23.5	74.9	18.8		447	4.5					
Total								13,855.7					40.9	



## Meteorological data for first and second class stations—Continued.

## ORMOC.

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied, -1.83 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
							Prevailing direction.	Total movement in 24 hours.	Form and its direction.	Amount (mean).		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	Upper.	Lower.		
1.	759.48	26	29.8	24.1	87.2	21.7	Variable	131.9	Ci.-S.	Cu.-N.	E	21.9 d T a. p. ● < p.
2.	58.58	26	31.4	21.5	79	19.3	NE, SW	131.6	Ci.-S.	Cu.-N.	NE	9.6 T d < p.
3.	58.87	26.2	31.4	22	83.7	20.9	N	151	Ci.-S.	Cu.-N.	E	9.1 d ● a. ● p.
4.	59.85	26	28.5	24.4	88.3	22	N	92.9	Ci.-S.	Cu.-N.	NE, E	12.2 d a. ● p.
5.	59.36	26.6	31	23.4	79.3	20.3	N quad.	171.4	Ci.-S.	Cu.-N.	E	2.3 p a.
6.	58.75	26.3	30.4	22.9	79.8	20.1	N quad.	153.4	Ci.-S.	Cu.-N.	E	2.8 d a. p.
7.	58.59	25.4	28.1	23.5	89.8	21.6	NW	120.7	Ci.-S.	Cu.-N.	E	18.7 T a. T d ● < p.
8.	59.14	25.4	30.1	21.8	86	20.7	NW quad.	103.2	Ci.-S.	Cu.-N.	E	8 T a. T d ● < p.
9.	58.55	26.6	30	23.3	86	22.1	Variable	106.1	A.-Cu.	Cu.-N.	E	8 T a. T d ● < p.
10.	58.68	27.1	32	23.8	72.3	19	NE quad.	156.5	Ci.-S.	Cu.-N.	E, NE	b a.
11.	59.52	26.4	31.4	21.4	69	17.4	SE quad.	181.9	Ci.-S.	Cu.-N.	E, NE	b a.
12.	60.10	25.3	30.9	19.1	65.5	15.9	NE	164.7	Ci.-S.	Cu.-N.	E	b a. T p.
13.	60.41	25.2	32.1	19.3	73.2	17	NE quad.	178.8	Ci.-S.	Cu.-N.	E, ENE	b a. T p.
14.	60.76	25	30.8	19.6	80	18.7	Variable	160	Ci.-S.	Cu.-N.	E	b a.
15.	61.48	26.2	31.8	22.2	75.5	18.8	NE quad.	166.1	Ci.-S.	Cu.-N.	E	b a.
16.	61.79	25	30.5	19.4	77.5	18.1	Variable	115.3	Ci.-S.	Cu.-N.	E	b a.
17.	61.05	24.9	30.5	19.3	77.2	17.7	SW, W	119.4	Ci.-S.	Cu.-N.	NE	b a.
18.	61.01	26	29.4	22.4	80.5	20	SW quad.	135.6	Ci.-S.	Cu.-N.	E	b a.
19.	61.04	26.5	30.6	21	74.7	19.1	Variable	128.4	Ci.-S.	Cu.-N.	E, NNE	b a. p p.
20.	61.43	26	30.8	21.5	77.3	19.2	Variable	164.7	Ci.-S.	Cu.-N.	E	b a. p p.
21.	61.36	25.2	31	18.8	77.2	18.2	N	125.4	A.-Cu.	Cu.-N.	E	b a. p p.
22.	61.56	26.1	30.9	20.8	75.7	18.7	Variable	143.2	Ci.-S.	Cu.-N.	E	b a. p p.
23.	61.70	25.2	31.7	20.5	81.8	19.2	Variable	140	A.-Cu.	Cu.-N.	E, ENE	b a. p p.
24.	61.46	25	30.1	20.7	81	19	N quad.	159.5	A.-Cu.	Cu.-N.	E, ENE	b a. p p.
25.	62.09	26.2	33.1	19.9	72	17.7	N quad.	152.5	Ci.-S.	Cu.-N.	E	b a. p p.
26.	62.41	26.7	31.9	22.4	72	18.2	NNE	128.9	Ci.-S.	Cu.-N.	NE quad.	b a. p p.
27.	62.37	26.1	31.2	22.4	65.8	16.2	N quad.	237	Ci.-S.	Cu.-N.	ENE	b a. p p.
28.	62.02	25	28.3	21.2	77.5	18.2	NW quad.	245.4	A.-Cu.	Cu.-N.	NE	2.6 p a. p.
29.	62.46	23.2	24	22.4	95.3	20.2	N, NW	59.6	Ci.-S.	Cu.-N.	NE	61.3 d ● a. p.
30.	62.24	25	27.4	22.2	80.2	18.6	NW	144.8	Ci.-S.	Cu.-N.	NE	.3 d p a.
31.	62.56	26.2	29.4	22.4	68.3	17.3	NE quad.	212.3	A.-Cu.	Cu.-N.	ENE	
Mean	760.67	25.8	30.3	21.6	78.3	19.1		147.8				
Total								4,582.2				142.7

## TACLOBAN.

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 2.4 meters; gravity correction not applied, -1.82 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	759.84						E	0.7	4.3		N.	ESE, SE	16.7	● a. p.
2.	58.82						Variable	.7	4	Ci.-S.	Cu.	E	3.8	
3.	58.97						SE, ESE	.8	4.7	Ci.	SW	ENE	15.2	● a. p. 13 < p.
4.	60.167						N, NE	.7	3.2		N.	E	49.5	●2 < a. ● p.
5.	59.44						ESE	.7	7	Ci.-S.	NW, W	Cu.	ENE	25.9
6.	58.86						Variable	.7	7	Ci.	NW	N.	E	1.3
7.	58.74						N	.7	9			Cu.-N.	ENE	12.9
8.	59.39						WNW, N	.2	8.5	Ci.-S.	W	Cu.-N.	E	38.4
9.	58.72						Variable	.2	7.3	Ci.-S.	W	Cu.-N.	E	11.5
10.	58.88						SE, NE	.2	2.5			Cu.	ENE	0.2 a.
11.	59.68	26.2	30.3	22.4	75.8	19	NNE, SE	.5	2.7	Ci.		Cu.	ENE	0.2 a. p.
12.	60.15	26.3	30.5	21.7	72.5	18.1	N	.5	1.8	Ci.		Cu.	E	0.2 a. p.
13.	60.62	26.2	30.5	22	78	19.5	Variable	.7	3.2	Ci.-S.	WNW	Cu.	E	0.2 a. p.
14.	60.86	26.4	30.8	22.6	78.7	19.9	Variable	.7	4.8			Cu.	ENE	0.2 a. p.
15.	61.37	26.6	31.3	23.3	74	19	WNW	.2	5.7	Ci.		Cu.	ENE	0.2 a.
16.	61.71	26.3	31.5	22	79.7	20.1	Variable	.5	5.2	Ci.-S.	NW	Cu.	E	0.2 a.
17.	61.03	26.2	31.3	22.3	77.3	19.4	N	.7	3.3	Ci.		Cu.	ENE	0.2 a.
18.	61.04	26.4	31.3	24	81	20.6	Variable	.2	7.7	Ci.-Cu.		Cu.	NE	2
19.	61.10	26.5	31.4	22.1	77.3	19.6	SE, S	.3	6.5	Ci.-S.	NW	Cu.	E, ENE	1
20.	61.53	26.3	30.8	22.9	79.5	20	SE	.5	4.3	Ci.-S.	NW	Cu.	E	.5
21.	61.42	26.2	31.4	22.4	78.2	19.5	WNW	.7	3.3	Ci.-S.		Cu.	E	0.2 a. 02 p.
22.	61.77	26.5	31.3	22.8	76.8	19.6	Variable	.3	2.7	Ci.		S.-Cu.	E	0.2 a.
23.	61.78	26.2	31.3	23.3	78.5	19.8	NW quad.	1	5.2	Ci.-S.	NW	Cu.	NE	0.2 a.
24.	61.44	26.5	30.5	23	77.3	19.8	Variable	.5	3	Ci.		Cu.	ENE	5.1
25.	62.30	27.2	32.5	22.9	72.5	19.1	ENE	1	4.2	Ci.-S.		Cu.	ENE	0.2 a.
26.	62.70	26.5	31.3	23.4	75.5	19.3	ENE	1	6.5	Ci.-S.		Cu.	NE	1
27.	62.84	25.4	29	22	71.7	17.1	N	1.8	8	Ci.	SW	Cu.-N.	NE	0.2 a.
28.	62.33	25.6	28.7	22.3	75.8	18.4	N	1.8	7.5	Ci.-S.		Cu.-N.	NNE	3.6 d p.
29.	62.55	23.5	25.2	22.5	92	19.8	N	1.3	10			N.	NE	130.8
30.	62.80	24.6	27.6	22.5	83.8	19.2	N	.8	9.2			Cu.-N.	NE	3.1
31.	62.98	24.8	28	22.4	82.8	19.3	WNW, NNE	1	7			Cu.-N.	NE	9.5
Mean	760.83	26	30.3	22.6	78	19.3		.7	5.9					
Total														334.8

*Meteorological data for first and second class stations—Continued.*

**CAPIZ.**

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied,  $-1.81$  mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Form and its direction.					
									Upper.		Lower.			
	mm.	°C.	°C.	°C.	P. et.	mm.	Km.	0-10.				mm.		
1.	759.72	26.4	30.9	23.8	87.	22.1	221	6.7	Ci.	N.	NE, ENE	12.7	☐ ● ☐ ☐ < p.	
2.	58.84	26.2	31	24.1	85.8	21.7	209.6	4.7	Ci.	Fr.-N., Cu.	ENE			
3.	59.04	26.4	30.8	24.5	87.2	22.3	195.5	6.8	Ci.	N.	NE			
4.	59.90	25.7	27.9	24.7	91	22.9	253.9	8.3	Ci.-S.	N.	NE	6.1	< d° ☐ ☐ p.	
5.	59.76	25.6	30	23.1	90	22.8	259.1	7.2	Ci.-S.	N.	NE	3	d° a. ● a. p.	
6.	59.19	25.8	30.2	23.1	86.2	21.1	183.8	6.3	Ci., Ci.-S.	N.	NE			
7.	59.07	26.2	30.4	25	84.2	21.2	214.9	9	Ci.-S.	N.	NE			
8.	59.40	26.3	31.7	23	84.5	21.3	161.4	2.2	Ci.-S.	Cu., Fr.-N.E., NE	NE	23.2	< ☐ ☐ ☐ ☐ p.	
9.	58.74	26.6	30.7	24.1	89.2	22.9	143.5	7.3	Ci.-S.	N.	NE	6.4	d° a. p. ☐ ☉ p.	
10.	58.70	26.6	31	24.6	87.7	22.5	137.1	6.8	Ci.-S.	Cu., N.	E	1	● d° a. p. ☐ ☉ p.	
11.	59.42	25.7	30.8	22.2	82	22	182.6	3.2	Ci.	Variable	E			
12.	60.12	25.2	30.6	22.4	77.8	18.5	174.2	4.2	Ci.	N., Fr.-N.	E	5	☐ a. ☐ p.	
13.	60.54	25.5	30.5	21.2	82.3	19.2	101.1	4.5	Ci.	Cu.	E	9.9	d° a. ☐ ● p.	
14.	60.82	25.6	30.9	22.9	83	20	115.9	4.8	Ci., Ci.-S.	Variable	E	2.5	☉ a. ☐ p.	
15.	61.54	25.9	30.8	23	84	20.7	92	6.2	Ci., Ci.-S.	Cu.	NE, N			
16.	61.72	25.3	31.2	21.5	83.8	19.9	101.1	4.3	Ci.	Cu.	E			
17.	60.97	24.9	31.2	20.5	83	19.2	87.3	2.8	Ci.	Cu.	E			
18.	61.03	25.3	31.8	21.2	85.3	20.3	77	5	Ci.	Variable	NE			
19.	61.16	25.6	31.2	22.5	84.7	20.4	94.6	4.8	Ci.	Cu.	NE	4.6	☐ ☐ ☐ ☐ p.	
20.	61.34	25.6	30.8	23.2	85.2	20.8	164.5	5.2	Ci.	Cu., Fr.-N.	NE	2.8	☉ d° a.	
21.	61.22	25.4	31.3	22.2	84.5	20.4	106.1	2.2	Ci.	Fr.-Cu.	E			
22.	61.76	25.3	31.2	21.7	86	20.5	92.2	4.3	Ci.	Cu.	NE			
23.	61.85	26.1	31	22.6	81.2	20.3	161.2	4.8	Ci.	Cu.	NE			
24.	61.52	26.2	31.2	24.2	83.3	20.9	170	6.2	Ci., Ci.-S.	Cu., N.	NE, ENE	3	☉ p.	
25.	62.49	26.2	31	24	84.8	21.3	240.4	6.7	Ci., Ci.-S.	Fr.-Cu.	NE	7.1	☉ p.	
26.	62.74	25.5	30.8	22.3	86.7	20.9	249	8.7	Ci.-S.	Fr.-N.	NE	17	☉ a. p. ☐ p.	
27.	63.22	25	29.7	22.6	79	18.5	397.6	7	Ci.-S.	N.	NE	1.8	☉ a. d° p.	
28.	62.84	25.5	30.2	23.5	71.5	17.4	366.3	6.5	Ci.-S.	N.	NE			
29.	62.58	25.7	29	24.5	78.2	19.2	252.1	9.3	Ci.-S.	N.	NE			
30.	63.08	24.6	27.3	23.3	85	19.4		9.8	Ci.-S.	Fr.-N.	NE	21	d° a. p.	
31.	63.34	24.6	29.4	22.5	84.5	19.3		7.7	Ci.-S.	Fr.-N.	NE	7.2	☉ a. p. ● a. d° p.	
Mean	760.89	25.7	30.5	23	84.1	20.5	179.5	6.1						
Total												130.1		

**CALBAYOG.**

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.80$  mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	759.49	26	32.1	23.3	86.3	21.3	NNE	156.4	6.7	Ci.-S.	S.-Cu. ENE	26.7	● T p.
2.	58.82	25.8	32.2	21.9	82.5	20	NE	159.9	3.3	Ci.-S., Ci.	S.-Cu. ENE	5	⋈ a. ● T p.
3.	58.84	25.8	30.2	22.6	87.5	21.5	NNE	124.8	6.2	Ci.-S.	S.-Cu. ENE, E	7.3	d a. ● T p.
4.	59.86	25.1	27.7	23.8	83.8	22.2	NNE	94.8	9.2	Ci.-S.	S.-Cu. E	25.7	d a. ● T p.
5.	59.59	24.8	29.1	23.4	85.2	20.4	ENE, E	144	7.2	Ci.-S.	S.-Cu. E	10.5	d a. ● T p.
6.	58.82	25.5	31.1	21.4	85.2	21.2	NE	148.6	6.7	Ci.-S.	S.-Cu. ENE, NE	-----	d a.
7.	58.86	24.4	26.6	23.3	83.3	21.3	NE quad.	117.9	7	Ci.-S.	S.-Cu. ENE	13.7	d a. ● T p.
8.	59.31	24.8	28.9	22.9	81.5	21.5	N	105.8	6.2	A.-Cu.	SE N. ESE	29.5	d a. ● T p.
9.	58.84	25	29.2	23.1	82.5	21.5	S	106.5	8.8	Ci.-S.	S.-Cu. E	16	d a. ● T p.
10.	58.81	25.2	29.7	23.2	88.5	21	S	132.1	3.2	Ci.	S.-Cu. NE	-----	d a.
11.	59.50	25.1	31.9	20.7	84.3	19.7	Variable	135.2	3	Ci.	S.-Cu. ENE	-----	d a.
12.	60.07	24.4	28.9	20.3	85.3	19.4	Variable	136.3	2.3	Ci.	S.-Cu. ENE	-----	d a.
13.	60.47	24.3	30.1	19.7	88.2	20	N, S	112.8	3.2	Ci.-S.	ESE S.-Cu. ENE	1.3	d a. d p.
14.	60.73	25.1	30.7	19.6	86.2	20.3	N quad.	134.1	4.3	Ci.-S.	S.-Cu. ENE, E	-----	d a.
15.	61.44	24.9	29.4	22	85.8	19.8	N, S	147.7	4.7	Ci.-S.	S.-Cu. ENE, E	-----	d a.
16.	61.65	24.4	30.1	19.9	87.3	19.7	Variable	133.2	2.3	Ci.	SE S.-Cu. ENE, NE	-----	d a.
17.	60.92	24.3	30.7	19.7	88.2	19.8	N quad.	151.1	3.5	Ci.-S.	S.-Cu. NE	3.3	d a. d p.
18.	60.88	25.6	30.7	21.8	86.7	21	N	142.4	4.7	Ci.	S.-Cu. NE	17.8	● p.
19.	61.09	24.1	29	20.8	90.5	20.2	N	128.9	5.8	Ci., Ci.-S.	S.-Cu. NE, ESE	5	d p.
20.	61.40	25.4	29.6	21.3	87	20.8	Variable	137.3	1.2	Ci., A.-Cu.	S.-Cu. NNE	-----	d a. d p.
21.	61.26	25.5	31.1	20.8	85.5	20.5	Variable	136.8	2.2	Ci.	S.-Cu. ENE	-----	d a. d p.
22.	61.54	25.5	32.5	21.2	84.5	20.2	N	143.3	1.5	Ci.	S.-cf., Cu. NNE	-----	d a. d p.
23.	61.65	25.4	31.3	21.4	84.8	20.4	Variable	130	2.7	Ci.	S.-cf. NE, ENE	.8	d a. d p.
24.	61.47	25.4	33.1	20.6	83.7	19.6	N quad.	162.4	4	Ci., Ci.-S.	Cu. NE	11.4	p p.
25.	62.77	25.4	30.9	21.4	84.2	20.1	N quad.	187.2	4.3	Ci.	S.-Cu. NE	5.3	● a. d p.
26.	62.76	25.4	30.9	21.4	84.2	20.1	N quad.	187.2	4.3	Ci.	S.-Cu. NE	-----	● a.
27.	63.02	24.5	29.4	21.7	78.7	17.8	N	287.7	6	Ci.-S.	ESE S.-Cu. ENE	-----	d p.
28.	62.56	24.6	29.3	21.7	81.3	18.6	N	211.8	5.3	Ci.-S.	S.-Cu. NNE	.3	d p.
29.	62.52	24.6	27.5	22.2	86.7	19.9	NNE	181	9	Ci.-S.	S.-Cu. NE	17.1	d p.
30.	62.84	24	27	22.6	92.8	20.5	NE	189.3	9.7	Ci.-S.	Fr.-N., s.-cu. NE	2.8	● d a.
31.	63	24.7	29.6	21.8	87.5	20.1	NE	247.3	6.8	Ci.-S.	S.-Cu. NE	-----	d a. d p.
Mean	760.78	25	30	21.6	87	20.3		150.9	4.9				
Total												190.5	

## Meteorological data for first and second class stations—Continued.

## LEGASPI.

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied, -1.77 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	760.32	25	28.5	22.2	90.5	21.4	NNE, NE	193.3	9.5	Ci.-S.	Fr.-N. E quad.	33.5	● a. p.	
2.	59.41	26	29.5	22.1	85.3	21.2	NE	129	4.2	Ci.-S.	Cu.-N. E	6.4	● a.	
3.	59.46	25.8	30.5	23	88.8	21.9	NNE, NE	152.8	8.8	Ci.-S.	Fr.-N. ENE	14.2	●° ∩ d a. ●° < p.	
4.	60.48	25.7	28.8	22.8	90.2	22.1	NNE, NE	191.7	9.8	Ci.-S.	Fr.-N. ENE	17.5	d a. p. ↑ ●° < p.	
5.	60.14	26.5	30	22.6	83.2	21.2	NE	232.7	5.3	Ci.-S.	Cu. ENE	12.4	● a.	
6.	59.43	26.5	30.4	21.9	77.8	20	NNE, ENE	160.8	2.7	Cl.	Cu. NE, ESE	2.3		
7.	59.40	25.5	28.5	22	84.5	20.4	NE, ENE	143.1	8.2	Ci.-S.	Fr.-N. ENE	10.2	● d° a. p.	
8.	59.69	26.3	30	23.4	84	21.2	NE quad.	129.7	4.3	Cl.	Cu. E	21.9	↑ ° ∩ d a. p.	
9.	59.19	26.3	31	22.5	87.8	22.2	NNE	94.8	6.5	Ci.-S.	Fr.-N. ENE	41.2	● a. p. d p.	
10.	59.03	26.4	29.5	22.4	86.7	22.1	ENE	58.9	5.2	Cl.	Cu.-N. ENE	.8	● d° a.	
11.	59.78	26.6	31.1	21.5	79	20.4	ENE	71.8	2	Cl.	Cu. E		d° a.	
12.	60.34	26	31.9	19.7	79.5	19.5	NE quad.	118.6	1.8	Cl.	Cu. ENE	6.1	●° a.	
13.	60.85	26.1	30.7	21.4	83.3	20.7	NE	98.6	4	Cl.	Cu. ENE		●° a.	
14.	61.06	26.4	31.4	20.6	80.5	20.4	NE, ENE	96	4	Cl.	Cu. ESE	2.3	●° a.	
15.	61.85	25	29.5	21.6	89.3	21	Calm	7.4	7.8	Ci.-S.	Fr.-N. SW	8.1	● d a. p p.	
16.	62	25.5	31.4	19.9	83	19.9	E	27.1	2	Cl.	Cu. E		●° a.	
17.	61.12	25.1	31.5	18.9	84.5	19.9	Calm	22.6	1.5	Cl.	Cu. E		●° a.	
18.	61.13	25.7	31.5	20.2	83.2	20.2	Calm	17.7	4	A.-Cu. NNE, W	Cu. E		●° a.	
19.	61.31	25.2	31.2	18.4	79.5	18.7	NE	62	2.3	Cl.	Cu. E			
20.	61.65	26.7	32	22	75.3	19.5	ENE	72.4	2.2	Cl.	Cu. ESE			
21.	61.56	26.3	31.9	19.9	76.8	19.4	ENE	48.8	.7	Ci.-S.	Cu. E			
22.	62.02	26.4	32	20.6	80.5	20.3	ENE	64.9	3.3	Cl.	Cu.-N. E		●° a. d° p.	
23.	62.06	26.4	31.1	23.1	78.7	20.1	NNE, NE	105.7	3	Cl.	Cu. NNE		●° p.	
24.	62.07	26	30	22.6	83.3	20.8	Calm	33.8	3.5	Cl.	Cu.-N. ENE	8	● a. p.	
25.	62.82	26.2	31.1	21	79.7	20	NNE	113.2	3	Cl.	Cu. ENE		● a.	
26.	63.31	26	30.2	21.9	77	19.2	NNE	210.6	4	Ci.-S.	Cu. ENE	8.6	●° p.	
27.	63.84	24.9	28.4	21.9	69.5	16.2	NNE	284.8	5.7	Ci.-S.	Fr.-N. NE		d° p.	
28.	63.50	25.3	28.5	22	70.3	16.8	NNE	322.4	1.8	Cl.	Fr.-Cu. NE			
29.	63.26	26	30.7	22.9	74.7	18.6	NNE	244.6	5.3	Ci.-S.	Cu. NE	3.8	d° p.	
30.	63.38	25.8	29.1	21.7	76.2	18.6	NNE		8	Ci.-S.	Cu.-N. NE	6.1	● a. p.	
31.	63.88	25.4	28.8	21.3	77.5	18.5	NNE, NE	370.8	6.8	Ci.-S.	Cu.-N. NE	22.9	● a. p.	
Mean	761.27	25.9	30.3	21.5	81.3	20.1		129.4	4.6					
Total												226.3		

## ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	mm.		
1.	760.70	25.3	28.3	23.2	90.3	21.6	NE	320.4	9.7	A.-Cu.	E N. NE by E, E	14.8	● a. ●° p.	
2.	59.74	25.5	27.7	23	87.3	21.2	NE	435.6	6.5	Cl.	S.-Cu. NE	2.4	●° d° a. d° p.	
3.	59.91	25.7	28	24	87.8	21.6	NE	457.9	8.3	A.-Cu.	E S.-Cu. NE	8.6	d° a. ●° a. p.	
4.	60.89	25.9	27.5	23.9	89.3	22.1	NE	579.9	9	Cl.-S.	S.-Cu. NE, ENE		●° a. d° p.	
5.	60.54	26.1	28.4	24.5	85.2	21.3	NE	713.7	6.8	Cl.	S.-Cu. NE	.3	d° p.	
6.	59.84	25.5	28.2	22.5	86.3	20.9	NE	362.8	7.5	Cl.	S.-Cu. NE	1	● a.	
7.	59.73	25.6	28	24.5	84.8	20.7	N quad.	564	8.2	A.-Cu.	NE S.-Cu. NE	1.3	d° a. ●° p.	
8.	59.98	26.4	29.7	24.4	85.8	22	NE	327.9	7.3	Cl.	N S.-Cu. NE	3.3		
9.	59.54	25.2	26.4	24.1	92.5	22	N	372.5	10	Cl.-S.	S.-Cu. NE	24.9	●° a. ●° p.	
10.	59.30	25.2	28.1	23.8	91.8	22	N	364.9	9.8	Cl.	S.-Cu. NE	30.8	● a. p. d° p.	
11.	60.08	25.1	27.6	23.6	90.5	21.4	NE	458.2	9.8	A.-Cu.	E S.-Cu. NE	7.9	d° p.	
12.	60.62	24.2	25.4	22.9	90.5	20.3	NE	447.6	9.2	Cl.-S.	S.-Cu. E	3.1	●° a. p.	
13.	60.92	24.7	28	20.9	87.2	20.1	SW, NW	246	4.2	A.-Cu.	E Cu., S.-Cu. NE, N		Ω² ≡ a. Ω² p.	
14.	61.01	25.5	28.3	22	87.5	21.2	NW quad.	277.9	7.3	Cl.	S S.-Cu. NE		Ω² p.	
15.	61.69	24.9	28.4	21.8	89	20.7	NW, N		5.8	Cl.	S.-Cu., Cu. NE	7.1	Ω² p.	
16.	61.78	25.5	30.8	22.3	88.2	21.3	SW, NW		3.3	Cl.	Cu. SE, S		d° a. Ω² ≡ p.	
17.	61.11	25.1	29.8	22.2	89.7	21.2	SW		8	A.-Cu.	N S.-Cu. Variable	16.8	Ω² p.	
18.	61.21	25.3	28	22.9	87.8	20.9	NE, NW	192.9	8.3	Cl.	S.-Cu. NE	3.6	● a.	
19.	61.45	25.3	29.3	21.4	83	19.8	NE		5	A.-Cu.	NE S.-Cu. NE	3.8	Ω² a.	
20.	61.61	24.8	26.5	23.3	88.2	20.5	NW, N		8.7	Cl.	S.-Cu. NW	5.1	●° d° a.	
21.	61.41	24.9	28.9	21.6	88.8	20.7	SW, N	193.1	7	A.-Cu.	Variable Cu. SW		Ω² Ω² p.	
22.	62.18	25.4	29.2	21	82.8	19.8	NE, SW	408.2	3.2	A.-Cu.	NE Cu. NE		Ω² ≡ a. Ω² a. p.	
23.	62.51	26.4	29.4	24.1	82.2	21	NE	582.2	7.2	Cl.	Cu. NE	6.1	Ω² p. d° p.	
24.	62.78	23.5	25.2	21.8	93.8	20.2	N quad.	693.9	10	Cl.	N. NE	73.8	● a. ●° p.	
25.	63.93	23.2	25	21.4	92.3	19.4	NE		10	A.-Cu.	N. NE	17.5	●° a. d° p.	
26.	64.31	24.1	25.3	22.1	87.7	19.6	NE	1,051.4	9.7	A.-Cu., Cl.	NE N. NE	10.7	d° a. ●° p.	
27.	64.30	24.8	26.8	22.6	71.5	16.6	NE	1,042.9	8	Cl.	S.-Cu. NE	.5	●° a. d° p.	
28.	64.44	24.7	26.6	22.4	66.7	15.4	NE	917.1	4.8	A.-Cu.	NE S.-Cu. NE	6.4	Ω² a. p.	
29.	64.02	25.1	27.7	22.2	78.8	18.6	NE	817.9	6.5	Cl.-Cu., A.-Cu.	S S.-Cu. NE	.5	d° a. p.	
30.	64.57	24.9	27.2	22.6	78.8	18.4	NE	1,004.3	8.3	A.-Cu.	S S.-Cu. NE	6.6	d° a. ●° p.	
31.	64.92	24.6	26.3	22.4	80.8	18.6	NE	979.9	8.8	Cl.	S.-Cu. NE	12.4	●° d° a. p. ●° p.	
Mean	761.65	25.1	27.7	22.8	86	20.4		552.5	7.6					
Total												268.8		

*Meteorological data for first and second class stations—Continued.*

PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied  $-1.73$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Form and its direction.	Upper.		Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.	Km.	0-10.				mm.		
1.	760.86	26.2	27.8	23.4	88	22.3	ENE	389.5	7	Ci.-S.	Cu.	ENE	19.1	● a. p.
2.	60.14	25.9	28.8	23.7	86.8	21.6	ENE	343.9	7.8	Ci., Ci.-S.	Cu.	ENE	4.3	● a.
3.	60.19	26.3	28.3	24	88	22.4	ENE	538.4	10	Ci.-S.	Cu.	E	24.4	● a. p.
4.	61.26	26.3	27.8	24	87.3	22.8	ENE	275.5	7.2	Ci., Ci.-S.	Cu.	ENE		
5.	60.92	26.8	28.9	24.8	85.3	20.6	E	262.3	7.3	Ci., Ci.-S.	Cu.	E	1.5	○ ● a.
6.	60.12	26.8	28.3	23.5	82.5	21.6	ENE	162.4	7.3	Ci., Ci.-S.	Cu.	E	12.2	● p.
7.	60.04	26.2	28.3	23.5	82.5	21.6	ENE	222.6	7.3	Ci., Ci.-S.	Cu.	E	12.8	○ ● a. p.
8.	60.30	25.8	28.3	23.3	89.8	21.1	E	280.8	7.7	Ci., Ci.-S.	Cu.	E	33	○ ● a. a. p.
9.	59.72	26.6	30.3	24.1	90.7		ENE	372.4	9.5	Ci., Ci.-S.	Cu.	E	4.8	
10.	59.59	26.4	28.8	24.4	88		E	124.2	9.2	Ci.-S.	S.-Cu.	E	62.5	● a. ● d p.
11.	60.34	25.1	29	23.1	90.7	21.4	ENE	152	7.8	Ci., Ci.-S.	Variable	ENE	20	● a. p.
12.	60.82	24.8	26.8	22	88	21	Variable	161.9	7.8	Ci., Ci.-S.	Cu.	SE	1	○ ● a. p.
13.	61.15	25.6	30.3	21.6	88.7	21	ENE	94.7	5	Ci.	Cu.	ENE	2.5	○ ● a. d° p.
14.	61.29	25.4	29.6	21	88.7	21.2	ENE	89.7	8.3	Ci.-S.	Cu.	ENE	5	○ ● a. p.
15.	62.05	25.4	29	23.2	89.5	21.1	NE	110	6.2	Ci., Ci.-S.	Cu.	E	16	○ ● a. p.
16.	62.12	25.2	30.3	22.5	89.3	21.1	NE	158.8	3.5	Ci.	Cu.	NE	5	○ ● a. p. d° p.
17.	61.32	25.1	29	22	89.3	21.1	NE	103.6	4.7	Ci.	Cu.	NE		○ ● a. p.
18.	61.44	24.9	28.3	21.7	89.2	20.7	NE, SE	99.1	2.3	Ci.	Cu.	SE		○ ● a. p.
19.	61.73	24.5	28.3	20.5	86.7	19.6	NE	181.5	2.8	Ci.	Cu.	ENE	13.5	○ ● a. d° p.
20.	61.62	24.9	30.3	21	87.3	20.3	NE	431.3	8	Ci.-S.	Cu.	NE	16.8	● a. p.
21.	61.64	25.4	30.3	22.5	86.3	20.6	NE	580.5	10	Ci.-S.	S.-Cu., N.	NE	35.3	● a. p.
22.	62.42	25.7	29.9	21.6	82.7	20.2	NE	183.8	10	Ci.-S.	Fr.-N.	SE	17	d ● a.
23.	62.84	25.5	28.8	24	86	20.8	NE	628.9	10	Ci.-S.	S.-Cu.	NE	16	● a. p. ✓ p.
24.	62.68	24.5	28.8	23	92.3	21.2	ENE	781	7	Ci., Ci.-S.	Cu.	NE	.8	● ✓ a.
25.	64.04	23.7	26.3	21.9	92.5	20.1	ENE	519.7	6	Ci., Ci.-S.	Cu.	NE	3.3	● p.
26.	64.59	24.5	26.6	22.7	88.7	20.3	ENE, NE	537.5	5.5	Ci.	Cu.	NE	.5	
27.	64.78	24.5	27	22.6	87.8	16	ENE	641.3	8.2	Ci.	Cu.	ENE	2.8	○ ● a. p.
28.	64.75	24.6	27.8	22.9	87.7	16.9	NE	845	7.8	Ci.	Cu.	NE	12	○ ● a. ✓ p.
29.	64.31	26.2	28.3	24	72.8	18.4	NE							
30.	64.83	25.8	28.1	23	76.5	18.8	ENE							
31.	65.19	24.7	27.3	22	83.8	19.5	NE							
Mean	761.91	25.4	28.5	22.8	86	20.7		331.9	7.2					
Total													333.1	

**SAN ISIDRO.**

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied,  $-1.69$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	mm.	°C.	°C.	°C.	P. et.			mm.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
												Upper.			Lower.
1.	761.45	23.9	30	21.7	90.8	20	N	0-12. 1.5	0-10. 9.5	Ci.-S.		Cu.-N., N.	mm. 23	● a. p. d p.	
2.	59.98	24.9	30.5	21.4	84.3	19.5	E	2.5 5.7	5.7	A.-Cu.	ESE	Cu.	E	d <sup>2</sup> a. Δ p.	
3.	60.30	25.2	31.1	21	80.5	18.9	NE	1.8 3	3	A.-Cu.	ESE	Cu.	E	d <sup>2</sup> a. Δ p.	
4.	61.20	25.5	30.2	21.8	80	19.2	E	2 7.3	7.3	A.-Cu.	ESE	Cu.	E	Δ a.	
5.	60.73	24.9	30.2	20.8	84.3	19.5	E	1.8 5.8	5.8			Cu.	E	1.5 ≡ d <sup>2</sup> a. Δ a. p.	
6.	60.21	24	29.3	21.3	85	18.7	N, E	1.7 5.8	5.8		SE	Cu.	E	d a. Δ a. p.	
7.	60.04	24.3	30.8	19.5	80.2	17.5	N, E	1.7 5.8	5.8	Ci.		Cu.	E	d <sup>2</sup> a. Δ a. p.	
8.	60.32	25	31.4	20.4	82	19.1	E, N	2 3.7	3.7	Ci.	SE	Cu.	E	Δ a. Δ a. p.	
9.	59.62	25.4	32.3	20.2	81	19.2	N	4 4.8	4.8	A.-Cu.	SE	Cu.	E	b ≡ Δ a. < p.	
10.	59.46	25.6	30	22.8	86.8	20.5	N, E	2.5 8.2	8.2	A.-Cu.	ESE	Cu.-N.	E	< p.	
11.	60.38	24.8	28.8	22	87.7	20.3	NE	2.3 8.8	8.8	Ci.-S.		Cu.-N. E, ENE	5	≡ d <sup>2</sup> a. Δ p.	
12.	60.79	24.3	28.7	21	83.3	18.6	E	2 7	7	A.-Cu.		Cu.	E	b a.	
13.	61.12	25.1	30.6	21.5	85.5	20	NE	2 6.5	6.5	A.-Cu.		Cu.-N.	E	.8 Δ a. d <sup>2</sup> p.	
14.	61.20	25.4	32	19.9	81.8	19.4	NE, N	1.2 4.5	4.5	Ci.	SE	Cu.	ESE	—	Δ a.
15.	61.82	25.6	32.5	20.4	82.2	19.3	N, E	1.8 5	5	Ci.		Cu.	E	b <sup>2</sup> ≡ a.	
16.	61.85	26	32.8	21.8	82.3	20.8	E quad.	1.7 5	5	A.-Cu., Ci.		Cu.	E	b a. Δ p.	
17.	61.25	26	32.4	21.2	80.2	18.6	N, NE	2 5.3	5.3	Ci.		Cu.	NE, W	—	Δ a. Δ a. p.
18.	61.50	24.2	30	20	84.2	18.6	NE	2.3 3.7	3.7	Ci.		Cu.	NW	—	Δ a. Δ a. p.
19.	61.66	23.8	31.1	18.8	84.5	18.1	NE	2.2 4.3	4.3	Ci.		Cu.	E	b <sup>2</sup> ≡ a.	
20.	61.64	24.6	31.3	18.2	81.5	18.5	N	1.8 4.8	4.8	Ci.		Cu.	Variable	—	b <sup>2</sup> ≡ a. d <sup>2</sup> p.
21.	61.66	26	32.3	22.8	81.3	20.2	N	2 7.2	7.2	A.-Cu.	N	Cu.-N.	W	Δ p.	
22.	62.32	25.5	32.5	20.8	81.3	19.4	NNNE	2.7 5	5	A.-Cu.	ESE	Cu.	ENE	—	Δ p.
23.	62.75	25.4	32.5	19.5	79.2	18.7	E quad.	2.3 4.8	4.8	Ci.	SE	Cu.	E	—	Δ a. Δ a. p.
24.	62.87	25.4	32.5	21.4	82.3	19.8	NE	2.3 7.7	7.7	A.-Cu.	ENE	Cu.	E	.8 Δ a. d <sup>2</sup> p.	
25.	63.88	25.2	30.6	21.6	84.2	19.8	N	2 9.3	9.3	Ci.-S.		Cu.-N.	E	d a.	
26.	64.24	24.3	31	19.9	82.7	18.3	NNNE, E	2.8 3.7	3.7	Ci.	SSE	Cu.	E	—	Δ a. Δ a. p.
27.	64.42	22.6	29.9	16.7	78.2	15.6	NE, NW	3.3 3.2	3.2	Ci.		Cu.	E	—	Δ a. Δ a. p.
28.	64.72	22.4	29.9	17.7	73.7	14.4	NE, NW	3 2	2	Ci.		Cu.	E	—	Δ a. Δ a. p.
29.	64.38	23.1	30.9	17.6	78.8	16.4	NE	2.5 4.3	4.3	A.-Cu.	ENE	Cu.	E	—	d <sup>2</sup> a. Δ a. p.
30.	64.66	23.1	31.7	16.9	79.5	16.3	N, ENE	3 3.3	3.3	A.-Cu.		Cu.	NE	—	Δ a. Δ a. p.
31.	64.76	23.8	30	19.5	75.2	16.2	NE	2.7 5.7	5.7	Ci.		Cu.	E	.3 d Δ a.	
Mean	761.84	24.7	30.9	20.3	82.1	18.8		2.2	5.3						
Total														26.9	

**DAGUPAN.**

[illegible]

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied,  $-1.65$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
1.	mm.	°C.	°C	°C	P. et.	mm.		0-12.	0-10.				mm.	
2.	760.71	26.9	31.6	23.6	81	21.2	Variable	2.7	9.7	Cl. S.	S.-Cu.		2	☉ a. d° p.
3.	59.32	25.8	30.7	22.9	86.5	21.1	SSE, NNE	2.3	8.7	Cl. S.	S.-Cu.			☉ a.
4.	59.71	26.5	32.6	21.9	82	21	NNE	3.2	8.8	Cl. S.	S.-Cu.			☉ a.
5.	60.70	27	32.5	22.1	80.8	21	S, NNE	3	10	Cl. S.	S.-Cu.		2.8	☉ a.
6.	60.08	27.3	31.9	22.5	81	21.6	NNE	3.3	9.7	Cl. S.	S.-Cu.			☉ a.
7.	59.28	26.4	30.1	23.3	82.3	20	SE	2.6	10	Cl. S.	N.-cf.		4.1	☉ a. ☉° p.
8.	59.44	25.9	30.1	21.5	80.3	20	NNE	2.7	10	Cl. S.	Fr.-Cu.	SSE		
9.	59.67	26.9	31.2	20.5	81.3	21	SSE, ESE	2.5	8.5	Cl. S.	S.-Cu.	NNE		
10.	59.29	26.6	30.6	22.2	85.2	21.9	NNE	3	8	Cl. S.	Cu.			☉ a.
11.	58.75	26.7	31.6	21.5	83.3	21.5	SE quad.	2.7	8.7	Cl. S.	S.-Cu.		6.3	☉ a. ☉° p.
12.	59.51	24.6	28.6	22.9	89.3	20.7	SSE	1.8	9.8	Cl. S.	S.-Cu.		29.7	☉° p.
13.	59.80	25.9	30.3	22.6	80.7	19.8	SE	3.2	10	Cl. S.	S.-Cu.		1.5	☉° p.
14.	60.57	26.2	30.6	23.1	79.5	20	E, NNE	3	8.8	Cl. S.	S.-Cu.	S		☉° a.
15.	60.72	27	31	23.6	80.3	21.2	Variable	2.5	10	Cl. S.	S.-Cu.			☉° a.
16.	61.45	26.4	30.5	21.6	81.5	20.7	NNE	3.2	7.7	Cl. S.	Fr.-Cu.	NNE		☉° a.
17.	61.69	26.8	30.6	24.6	78.3	20.4	NNE	3.3	4.7	Cl. S.	Cu.	NE		
18.	61.12	26.8	29.7	24.8	73.3	19.1	N	4	4.7	Cl. S.	Cu.	NbyE		
19.	61.45	26.2	29.7	24.4	74.3	18.2	N	4.2	10	Cl. S.	Cu.	N		
20.	61	25.1	29.7	20.4	75.3	18.2	N quad.	3.2	7.2	Cl. S.	S.-Cu.			
21.	61.32	24.2	30.2	19	82.3	18.5	SE quad.	1.8	6	Cl. S.	Cu.	NW	☉° ☉° a.	
22.	61.42	24.9	30.4	19.6	81.5	19	N quad.	2.8	5.8	Cl. S.	Fr.-Cu.	NNW	☉° ☉° a.	
23.	61.99	26.5	30.2	22.6	75.8	19.5	NNE	3.7	7	Cl. S.	Cu.			
24.	61.94	26.3	32	21	78	19.6	SSE, WNW	2.8	9	Cl. S.	S.-Cu.			☉ a.
25.	62.54	25.8	30.6	21	81.3	19.9	SSE, WNW	3	9.5	Cl. S.	Cu.	NNE, NNW		☉ a.
26.	63.65	26.1	28.5	24.7	76.5	19.2	NNE, N	5.3	10	Cl. S.	Cu.	NbyE	p° a. ☉° p.	
27.	63.82	26	29.5	23.7	72.7	18.2	NNE	4.5	9.7	Cl. S.	S.-Cu.			☉ a.
28.	63.44	25.3	30.1	20.9	70.5	16.6	SE quad.	3.2	3.7	Cl. S.	S.-Cu.			☉ a.
29.	63.82	24.6	29.7	20.2	69.7	15.9	SSE	3.5	3	Cl. S.	Cu.			☉° ☉° a.
30.	63.93	24	29.6	18.1	78.3	17.2	S, NNE	2.7	6.7	Cl. S.	S.-Cu.			☉° a.
31.	63.82	24.5	29.9	19.4	77.7	17.7	S, N	2.5	6.5	Cl. S.	S.-Cu.			☉° ☉° a.
31.	63.68	24.2	31.6	18.1	73.7	16.4	SSE, NNE							
Mean	761.28	25.9	30.5	21.9	79.2	19.6		3	7.9					
Total													46.4	

## Meteorological data for first and second class stations—Continued.

BAGUIO.<sup>1</sup>[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.	Upper.			Lower.	
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.			
1.	638.20	17.5	24.2	15.2	84.8	12.5	E	332.3	9.1	A.-Cu.	SE	Cu.	ESE	11.4	≡ p.
2.	36.92	17.5	24.2	14.9	84.5	12.3	E, SE	485.9	6.6	A.-Cu.	SE	Cu.	SE	1	d a. p.
3.	37.44	18.2	24.5	14.8	83	12.3	E, SE	305.2	5.9	Ci.		Cu.	ESE		d a. p.
4.	38.26	18	24.5	15.2	81.3	12.3	E, SE	296.6	6.6	A.-Cu.	S	Cu.	SE	.5	d a. p.
5.	37.60	17.5	23.2	14.7	85.3	12.6	SE	287.2	8.4	Ci.-Cu.	WSW	Cu., N.-cf.	E		d a. p.
6.	36.76	16.1	18	14.1	94.2	12.8	Variable	271.3	9.9	Ci.-S.		N.		7.1	d a. p.
7.	36.71	17	24.2	13.2	72.2	10.3	SE	453.5	3.9	Ci.		Cu.			p.
8.	37.35	19.1	24.1	15.4	78.8	12.8	SE quad.	328.9	6.9	Ci.-S.		Cu.	SbyE		p.
9.	37.10	18.7	24.1	15.3	87.3	13.9	E, W	278.3	5.4	Ci.		Cu.	SE	.8	d a. p.
10.	36.76	17.6	21.3	15.5	94.3	14.1	Variable	231.8	9.6	A.-Cu.	SW	Cu.	NE	4.4	d a. p.
11.	36.98	16.4	21.1	14.8	92.7	12.8	SE, SW	298.1	10	A.-Cu.		S.-Cu.	NE	92	d a. p.
12.	37.19	16.8	20.6	14.7	89	12.6	E	236.1	8.9	A.-Cu.	W	Cu.-N.	SE	23.1	d a. p.
13.	37.77	16.5	21.8	14.3	95.2	13.2	SW quad.	238.3	9	Ci.-S.		S.-Cu., Cu.	ESE	5.6	d a. p.
14.	38.04	16.8	20.9	14.7	93.3	13.3	SW quad.	185.3	9	Ci.-S., A.-Cu.		S.-Cu., Cu.	ESE, SE		d a. p.
15.	38.69	17.1	22.3	14.5	87.8	12.7	ESE	248.8	4.7	Ci.		Cu.	SE		d a. p.
16.	38.86	16.9	22.6	13.9	86.3	12.3	W quad.	216.7	3.6	Ci.		Cu.	SE, WSW		d a. p.
17.	38.18	16.4	22	13.7	79	10.9	N quad.	309.8	3.7	Ci., Ci.-S.		Cu.	SSE		d a. p.
18.	38.03	16.1	21.4	13.5	64	8.8	Variable	260.3	3.6	Ci., Ci.-S.		Cu.	NNW		d a. p.
19.	37.82	16.1	23.8	12.6	77.3	10.4	SE	285.4	4.3	Ci.-S.		Cu.	ENE		d a. p.
20.	38.09	16.3	23.7	13.4	87.3	11.9	E	325	6.1	Ci.		Cu.			p.
21.	38.31	16.9	22.5	14.1	83.2	11.8	Variable	274.1	5.3	Ci., A.-Cu.		Cu.	NW		d a. p.
22.	38.93	17.2	21.1	14.1	83.8	12.2	W	188.1	7.6	A.-Cu.	SE	Cu.	NNW		d a. p.
23.	39.29	16.8	24.4	13.4	79.8	11.2	Variable	281.9	5.1	Ci.		Cu.	ESE		d a. p.
24.	39.34	17	22.3	13.8	84.7	12	Variable	207.9	7.9	A.-Cu.	SSE	Cu.	SE	1	d a. p.
25.	39.97	16.4	20.1	14.3	89.5	12.4	Variable	179.1	9.9	A.-Cu.		S.-Cu.	SE		d a. p.
26.	39.85	15.9	23.2	12.1	82.7	11	SE	399.9	6.9	Ci.		Cu.	SSE		d a. p.
27.	39.59	15	22.1	11.2	75.3	9.4	SE quad.	345.4	4.3	Ci.-S.		Cu.	SE		d a. p.
28.	39.69	14.1	20.5	10.1	71.5	8.6	E, SE	411	4.3	Ci.		Cu.	Variable		d a. p.
29.	39.83	15.6	22.9	12.6	74.8	9.9	E, SE	517.7	4.1	Ci.		Cu.	SE		p.
30.	39.78	16.5	22.8	12.3	70	9.5	E	593.4	4.9	A.-Cu.	S, SSW	Cu.	E		d a.
31.	39.80	15.9	21.3	11.6	70.5	9.3	E, SE	723	3.4	Ci.		Cu.			d a.
Mean	638.29	16.8	22.4	13.8	82.7	11.7		322.5	6.4						
Total								9,996.3							146.9

## VIGAN.

[ $\phi=17^{\circ} 34' N$ ;  $\lambda=120^{\circ} 23' E$ ; barometer above sea, 14.7 meters; gravity correction not applied, -1.61 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1	760.76	25.6	30.2	22.5	85.3	20.8	N, NE	2.8	8.3	Ci., A.-Cu.	S.-Cu.	NNE		d° a. p.
2	59.26	26	32.1	21.8	87.7	21.8	N quad.	1.3	6.8	A.-Cu.	SSE	S.-Cu.	SE	
3	59.83	26.5	31.4	22.7	86.7	22.2	N quad.	1.5	4	Ci.		Cu.	NNW	
4	60.80	26.5	31.4	20.7	86	22	NNW, NNE	1.7	4.5	Ci.	SW	Cu.	NNW	○ d° p.
5	60.04	27	32	23	75.8	19.9	NE	2.5	5.3	A.-Cu.	SW	S.-cu., Cu. NE, NNE		
6	59.27	26	31.5	21.3	84.7	21.2	NNW, SSE	1.2	6.3	A.-Cu.	ESE	Cu.	NNE	
7	59.48	25.6	31	21.7	89.2	21.6	NNW, SE	1.2	3.8	A.-Cu.		Cu.	NNE	
8	59.87	25.5	31.7	20.5	87.8	21.1	Variable	.8	.5	Ci.		Fr.-Cu.	NE	≡ a.
9	59.22	25.6	31.2	21.7	92.2	22.4	Variable	1	1.8	Ci.		Cu.	NNE	≡ a.
10	58.79	26.4	31.2	21.8	92.2	23.4	Variable	.8	2.5	A.-Cu.	NNW	Cu.	N, NNE	≡ a.
11	59.47	26.8	31.2	24	86.7	22.6	ESE, NW	1.2	8.7	A.-Cu.		S.-Cu.	SSW	
12	60.03	26	30.8	23.8	83	20.8	Variable	1	8	A.-Cu.	SW	S.-Cu.	SSW	d° a.
13	60.64	25.6	31.2	22.2	82.8	20.1	E quad.	1.2	5	A.-Cu.	SW	S.-Cu.	SSW	
14	60.84	25.7	31.2	20.8	83.2	20.2	Variable	1.3	5	A.-Cu., Ci.		S.-Cu.	SSW	
15	61.62	26.1	31.6	21.5	81.5	20.2	NE quad.	1.5	5.7	A.-Cu.	SW	S.-Cu.	SSW	
16	61.85	25	31.7	20.2	80.3	18.6	N quad.	1.2	2.7	A.-Cu.	SSW	S.-Cu.	SW	
17	61.22	24.4	30.1	19	79.5	17.8	N quad.	1.3	.3	Ci.		Fr.-Cu.		
18	61.67	22.9	28.8	17.8	84.3	17.4	N quad.	1.5	2.3	Ci.		Cu.	N	≡ a.
19	61.09	23.9	29.8	18	81.7	17.8	N quad.	.7	1.3	A.-Cu.		Cu.		≡ a.
20	61.40	25.4	30.9	21.2	75.3	18	N quad.	1	1.2	A.-Cu.		Cu.		
21	61.63	24.4	30.9	20.4	86.2	19.4	Variable	1.2	1.5	Ci.		Fr.-Cu.	SW	≡ a.
22	61.97	25.2	31	19.5	78.7	18.4	N quad.	1.3	1.3	Ci.		Cu.	NE	≡ a.
23	62.08	26.2	32	20.3	79	19.6	NNW, ENE	1	2.8	A.-Cu.	NE	Cu.	WSW	≡ a.
24	62.48	25.6	30.5	20.9	85.2	20.6	N quad.	1	5	A.-Cu.		Cu.	NNW	≡ a.
25	63.83	24.2	28.2	21.2	84.3	18.8	N	3.3	4.7	A.-Cu.	SSW	S.-Cu.	SSW	✓ ° p.
26	64.13	23.1	27.2	19.4	77.5	16.2	NNE	3.2	1.2	Ci.		Cu.		✓ ° p.
27	63.62	24.2	30.2	19.2	66.3	14.6	NNW	1.3	1.5	Ci.		Cu.		
28	64.01	24.7	30.7	19.7	63.5	14.7	N quad.	1.7	4.2	A.-Cu.	SW	S.-Cu.	NNW	
29	63.96	24.6	30.2	18.8	68.8	15.7	N, E	1	1.2	Ci.		S.-Cu.		
30	64.19	25.1	31.7	20.1	64.7	14.9	NNE, NE	2.3	1.8	A.-Cu.	SW	Fr.-Cu.	NE	✓ ° p.
31	63.86	26.3	32.1	22.7	62.5	15.4	NE	2.2	2	A.-Cu.	SW	Cu.	ENE, ESE	
Mean	761.38	25.4	30.8	20.9	80.7	19.3			1.5	3.6				
Total													0	

<sup>1</sup> The barometric readings of this station are not reduced to sea level.

## Meteorological data for first and second class stations—Continued.

## TUGUEGARAO.

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	763.18	22.5	24.5	21.1	98.7	20	NW	0.7	9.7		Cu.-N.	N	77.9	● a. ● <sup>2</sup> p.
2.	61.36	23.5	26.1	21.5	92.5	19.9	NW	.2	8.8		N.	N	8.4	● <sup>2</sup> a.
3.	60.86	24.7	31.7	20.6	87.2	20	Equad.	.5	6.2	Ci.	S.-Cu.	S	16	● <sup>2</sup> a.
4.	62.60	25.1	33	22.3	88.5	20.6	N, NW	.3	6.7	Ci.	Cu.	E	16	● <sup>2</sup> a. ● d <sup>o</sup> p.
5.	62.62	23.4	27.5	21	92.2	19.7	NW	2.7	7.7		Cu.-N.	NE	1	● a.
6.	61.34	23.4	27.5	21.3	93.8	20.1	NW quad.	1.8	9.3		Cu.-N.	N	1	d a. p.
7.	61.16	23.4	28.5	20.8	90.3	19.2	NE	.3	8.7		N.	SE	1	● <sup>2</sup> d <sup>2</sup> a.
8.	60.57	25	32.5	21	86	20	SE	.5	4.5		Cu.-N.	S	1	● <sup>2</sup> a.
9.	60.06	24.8	30.7	20.5	85.3	19.7	NW, N	.7	3.2		S.-Cu., Cu.	S, N	1	● <sup>2</sup> a.
10.	60.52	23.8	28	22	89.5	19.6	NW	1.5	8.8	Ci.-S.	S.-Cu.	N	2	● <sup>2</sup> a.
11.	61.84	22.3	25	20.4	90.5	18.1	NW	.5	9.2		S.-Cu.	N	2	● <sup>2</sup> a.
12.	62.05	21.8	25.5	19.4	91.2	17.6	N, NW	.3	8.5		S.-Cu.	N	2	● a. d <sup>o</sup> p.
13.	61.20	24.2	31.4	20.6	85.7	19.1	Variable	.8	6		S.-Cu.	S	2	● d p.
14.	61.59	24.2	31	21.2	87.7	19.6	Variable	.7	7.2		S.-Cu.	S	2	● <sup>2</sup> a.
15.	62.14	24.9	31.5	22	90.3	21	Variable	.5	8.3		S.-Cu.	S	2.8	● <sup>2</sup> a.
16.	62.05	25.3	32.8	21.27	84.5	20	NW	.8	5.8		Cu.	SW	2.8	● a.
17.	61.60	23.6	29.8	19.6	82	17.6	NE	.8	3.3		Cu.	N	2.8	● a.
18.	61.82	22.7	30.9	18.5	85.5?	17.3?	Variable	.7	6	Ci.	Cu.	N, NW	2.8	● a.
19.	63.18	21.1	24.6	18.2	91.7	17	N quad.	1.5	10	A.-S.	Cu.-N.	N	2.8	● a.
20.	62.39	23.3	30	19.8	86	18	NW	.3	6.8	A.-S.	Cu.	SE	2.8	● a.
21.	61.50	25	32.8	21	84	19.5	NW	.8	2.5		Fr.-Cu.	S	2.8	● a.
22.	62.92	24.1	30	20.1	82.2	18.1	NW, N	1.3	4.2		S.-Cu.	N	2.8	● a.
23.	64.01	23.7	29.6	20.4	86.3	18.6	NW	.7	9.2		S.-Cu. ENE, NE	NE	2.8	d <sup>o</sup> a.
24.	63.60	24.3	30.6	21	84.3	18.8	NE	.5	7.7		S.-Cu.	NW	8.1	d <sup>o</sup> a.
25.	65.23	22.9	26.7	20.1	87	17.9	N quad.	1.8	9.5		Cu.-N.	N	8.1	● a. ● p.
26.	67.15	21.7	25.5	18.3	80.8	15.6	NW, NE	2.8	7.3		S.-Cu.	NE	8.1	● a. d p.
27.	66.72	21.2	25.1	17.7	79.2	14.6	NW, N	1.8	7.7		S.-Cu.	N	8.1	d <sup>o</sup> a.
28.	66.13	22.6	30.4	18	79	15.9	Variable	.5	7		S.-Cu.	SE	8.1	d <sup>o</sup> a.
29.	66.20	22	28	17.2	87.5	17.2	NW	.7	4.7	A.-Cu.	Cu.-N.	W	8.1	d <sup>o</sup> a.
30.	67.58	21.6	26.5	19	87.8	16.7	NW, N	3.8	9	A.-Cu.	Cu.-N.	N	5	d <sup>2</sup> p.
31.	67.56	21.5	26.8	18.2	83	15.7	NW, N	1.2	8.8		S.-Cu.	E	5	● <sup>2</sup> a.
Mean	762.99	23.3	28.9	20.1	87.1	18.5		1	7.2					
Total														121.2

## APARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	763.51	23.6	25.2	21.8	91.3	19.8	NE	483	10	-----	S.-Cu., N. E, NE	E	42.4	● a. p.
2.	61.36	23.4	25.5	22.1	93	19.9	E	276.5	9.2	-----	N.	E	17.3	● a. ● <sup>2</sup> p.
3.	60.92	24.5	29	21.1	86.7	19.8	NE	207.8	1.7	A.-Cu., Ci.	S	S	3.8	● a.
4.	62.72	23.7	27.2	22	92.2	20.1	NE	312.3	10	-----	S.-Cu.	E	31.1	● a. p.
5.	63.27	23.3	24.8	21.3	84.2	17.9	NE	747	10	-----	S.-Cu., N. ENE, NE	E	4.4	● <sup>2</sup> a. p.
6.	61.84	22.4	24.3	21.2	91.2	18.3	ENE	572.9	10	-----	N.	ENE	31.6	● <sup>2</sup> a. ● p.
7.	60.98	22.8	26	21	91.3	18.8	E	112.4	7.2	-----	S.-Cu.	E	31.6	● a.
8.	60.40	24.1	29.5	21	87.8	19.6	E	200.2	1.2	-----	S.-Cu., Cu.-N.	S	31.6	● a.
9.	60.22	24.3	28.4	21	89.2	20.1	NE, E	263.4	3.3	-----	S.-Cu.	NE	31.6	● a.
10.	61.17	23.4	25.2	22.5	83.7	17.8	E	458.6	10	-----	S.-Cu.	E	31.6	● a.
11.	62.16	22.8	24.4	21	77.7	16	E	350.6	10	-----	S.-Cu.	ENE	31.6	● a.
12.	61.98	21.5	24	20.1	88.5	16.8	SE	132	10	-----	S.-Cu.	E	3.8	● <sup>2</sup> p.
13.	61.67	23.1	27.5	20.2	86.5	18.1	SE	301	5.3	-----	S.-Cu.	E	3.8	● <sup>2</sup> a. p.
14.	61.70	24.3	28	22	83.5	18.9	E	192.8	4.5	A.-Cu.	SW	E	2.3	● p.
15.	62.12	24.9	28.4	22.5	86.3	20.1	E	160.9	5.5	A.-Cu.	SW	E	2.3	● a.
16.	62.15	24.6	28.1	22	84.5	19.3	Variable	251.1	5.2	-----	S.-Cu., Cu.-N. W, NE	-----	2.3	● a.
17.	61.78	23.7	28	20	80.2	17.4	Variable	194.9	.2	-----	Cu.-N.	-----	2.3	● a.
18.	61.88	22.8	27	20.1	88.3	18.3	Variable	260.5	5.8	A.-Cu.	SW	-----	2.3	● a.
19.	63.37	21	23	19.1	88.7	16.4	E	455.5	10	-----	S.-Cu., Cu.-N. W	-----	61.2	● a. ● <sup>2</sup> p.
20.	62.46	22.4	26.6	19.4	88.2	17.7	E	151.2	6.8	A.-Cu.	S	SE	5.8	● a. ● <sup>2</sup> p.
21.	61.48	24.1	29.3	20.6	84.8	18.8	N	344.5	.2	-----	Cu.-N.	SE	1.3	● a. p.
22.	63.34	24.3	28	21	78	17.6	N, E	333.7	3.8	A.-Cu.	S	N	1.3	● a.
23.	63.91	23.8	27	22.2	80.8	17.7	E	408.8	8.3	A.-Cu.	SE	E	1.3	● a.
24.	63.58	24	27.1	21.5	81	17.9	E	271.2	5.7	A.-Cu.	SW	E	1.3	● a.
25.	65.70	21.8	24.6	20.5	91	17.7	NE	388	9.2	-----	N.	NE	1.8	● <sup>2</sup> a. p.
26.	67.81	20.8	23	18.6	78.3	14.2	ENE	633.8	10	-----	Cu.-N.	NE	32	● <sup>2</sup> a. p.
27.	67	21.2	24.5	18.6	70.7	13.3	E	499.9	9.3	-----	S.-Cu.	E	9.8	● <sup>2</sup> a. p.
28.	66.28	21.9	25.6	17.4	75.2	14.6	E	305.6	6	-----	S.-Cu.	E	3	● <sup>2</sup> a.
29.	66.20	22.2	26	19.1	81.7	16.2	E	266.5	8.8	A.-Cu.	S, E	E	11	● p.
30.	68.45	20.8	22.7	19	82.3	15	NE	806.7	10	-----	N.	NE	15.2	● <sup>2</sup> a. p.
31.	68.04	21.1	23.5	18.8	80.8	15	E	516	8.3	-----	S.-Cu., N. E, NE	NE	1.8	● <sup>2</sup> a.
Mean	763.21	23	26.2	20.6	84.8	17.7		350.3	7					
Total								10,859.3						277.4

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, JANUARY, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Jolo	1.3							0.3	1.1	2.5						
Isabela, Basilan					0.5		3		4.1	39.9	0.8					
Zamboanga		4.4		3.8	5.1		4.8				11.4					
Davao					53.3					11.7						
Cotabato	29.2		1	1.5						10.2						
Cagayan, Misamis	3.3			2												
Dapitan	2.5		11.4	3.6		3.8	2.5	2	68.6	61						
Butuan	8.9	1.5	3.8	18.6	1.3	2.8	2	31	.5	4.8			2.6			
Dumaguete	2.5			15.5		2.5										
Yap, W. Carolines	1.5	2.8		1.3	8.2	4.6	3		1.3							0.3
Maasin	7.1		16		5.8		7.1	11.4	8.1							
San Jose Buenavista					1.3		.3			5.1						
Cuyo																
Borongan	10.9	2.6	46.2	28.1	18.8	24.1	31	18	7.4							
Masbate		9.4	16	55.1	3.6		.8	.8	1.6						0.5	
Romblon	1.3	3.3	20.6	13.4	5.6		2.5	.8	1					12.2	8.4	
Laoang	11.9	11.4	4.6	39.1	15.5	8.9	4.1	6.6	3.8	.3		0.3	.5		1.6	
Gubat	65.8	1.3	5.3	18.8	3.8	16.3	11.9	23.6	10.2	1		3.3			2.3	
Sumay, Guam	5			2.5					5.1							
Calapan	36.1	2.3	1.5	1.6			.8		1		2.1			3	27.7	.3
Virac	12.5	3.8	4.6	18.5	1.3	1.5	9.9	10.7	1.3			47.8	5.4	.3	4.1	
Nueva Caceres	27.2	8.7	5.3	6.4			1	.8	.4							
Batangas	11.5					1.6				4.8	.3					
Silang	12.7		4.6		2.5	14.2				2.3	16					7.9
Santa Cruz, Laguna	54.3		1	.3	.5	.8			4.6	3.8	.8	1.6				
Antipolo	77.7				2.8				20.6	1.3	3	1.3				
Iba	.5					.5				14.5	.1					
Tarlac	6.6															
Baler	93.8	1.3	1.3	1	15.5	1.3	1			50.5	23.7	5.1	.3	1.8		
San Fernando, Union	2	.5				21.8				.8		.3				
Echagüe	36	.5		5.8	8.6	12.7				4.6	6.1					
Candon						17.5										
Laoag				.8												
Santo Domingo, Batanes	21.8	16.7	70.4	33.8	13	5.6	7.2	2.8		4.3			8.1			

Station.	Day of month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Jolo					2.8								4.6			12.6	
Isabela, Basilan												2		4.1		54.4	
Zamboanga														3.6	12.4	45.5	
Davao	6.9															71.9	
Cotabato	12.7	3.3			2.5	30.5			0.5			13.7	.3		1	106.4	
Cagayan, Misamis									4.8		2.8	.8				13.7	
Dapitan		12.2	1.3		5.1						18.1	40.9	3.6		9.4	246	
Butuan					19.8				2.3	0.3	19.1	1.5	.3	3.5	5.6	130.2	
Dumaguete										2.8	1.5	17.2	12.7	3.3	7.9	72.9	
Yap, W. Carolines			2.3	2.3	4.8		0.8				1.5	1.3	.3	1	.3	37.3	
Maasin										7.4	9.7	56.9	19.3	6.9	17.5	173.2	
San Jose Buenavista												.3				7	
Cuyo												.1	.8			9	
Borongan	.8	1.3	13.5			.5	1	1.5	2.3	7.1	5.1	8.4	130.3	6.6	4.3	369.8	
Masbate							1		5.6	4.1				4.8	2.5	105.8	
Romblon		1.3	54.4				11.2	.3		3.8				14.5	19.6	174.2	
Laoang		.5				1	8.1	3	21.1	9.4	2.3		11.7	6.1	4.3	176.1	
Gubat		2					1.8		2.5	10.2	2.6		13.5	5.3	5.6	207.1	
Sumay, Guam			2.5													15.1	
Calapan							2.8	8.1	.3	1.6	1.3	6.6	1.8	4.4	5.9	109.2	
Virac		.5					2.1	2.3		1.3			2	5.8	9.7	145.4	
Nueva Caceres								1	9.4	2.6				1.8	1.8	66.4	
Batangas							1.8	12.2							1.3	33.5	
Silang																60.2	
Santa Cruz, Laguna							20.3	1.8	5.9	2.6	.5			3.6	2.1	104.5	
Antipolo								.8	.3							107.8	
Iba									7.6							23.2	
Tarlac									1							11.4	
Baler	1	12.7					.8	.8	.3	.3	2.5			8.6	.5	224.1	
San Fernando, Union																25.4	
Echagüe									.5					8.2	1.8	84.8	
Candon																17.5	
Laoag																.8	
Santo Domingo, Batanes		24.9	.3	2.8				1	2.5	1.3	3.8	30	27.2	2.3	.8	280.6	

\* 30 days of observation.

b 23 days of observation.



## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, JANUARY, 1913.

Date.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Dapitan.		Butuan.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	31.1	22.7	33.6	23.1	32.5	23.7	32.4	20.9	33.9	21.9	31.5	21	30.6	25.8	26.5	23.1
2	31.2	23.1	32.1	23.6	30.4	23.4	30.7	22	32.8	22.9	31.1	22.9	32.1	25.3	28.5	22.4
3	31.3	21.8	34.2	22.6	31.5	23	30.7	20.1	33.5	20.8	30.1	19.8	31.9	25	28.6	20.8
4	31.4	21.9	31.2	20.3	29.5	22.4	29.5	21.9	32	23	29.6	23	30.8	24.2	28.7	23.6
5	30.4	23.3	31.3	20.6	29.4	22.8	32.7	21.9	33.5	22.5	31.3	21.2	30.7	25.4	29	21.6
6	31.9	22.9	32.1	22.1	31.6	22.6	30.2	20	30.9	21	29.7	20.2	29.9	25.1	28.1	21.9
7	31.7	22.1	34.1	22.1	31.9	22.6	27.7	22	32.5	22.5	29.1	23.5	30.9	24	27	23.3
8	31.2	23.1	33.3	22.6	30.1	23.5	30.7	21.9	33.6	22.6	30.9	22.5	32.2	25	29.5	22.7
9	31	21.4	31.1	22.4	29.5	22.9	32.2	22	34.2	23.2	31	23	32.8	24.8	29.5	22.9
10	32.5	21.3	31	22.5	29	22.9	28.7	22.8	32.5	23.4	29.3	23	29.2	22.4	27.5	23.7
11	32.1	22.1	31	22	29.3	23.4	31.2	20.4	33	22	30.4	20.6	29	24.7	28.1	21.1
12	31.7	21.8	32.1	21.5	31.1	22.6	31.1	19.9	33.1	19.8	29.4	18.9	29.3	23.9	27.7	20.7
13	31.3	21.1	33	20.8	32.1	21.5	31.2	21	34	21.5	30.9	20.6	32.2	23.9	28.1	20.6
14	32.9	20.4	31.3	20.7	30.1	22	32.7	19.9	34.7	21.2	30.6	19.9	33	24.2	29.1	22.4
15	31.5	21.4	33.6	20.7	30.5	21.9	30.9	17.7	34.2	18.5	30.1	17.5	32.9	22.1	28.1	20.3
16	31.1	20.4	31.6	20.3	30.7	21	30.6	20	34.5	21	29.5	20.1	32.1	23.7	27	21.2
17	31.9	20.7	30.8	19.9	29.5	21	30.2	19.3	33.5	19.6	29.6	19.5	32.1	23.3	28.2	20.6
18	31.9	21	32.1	20.3	29.6	21.5	32	20.9	32.7	22.5	30.5	21.9	33.5	20.9	27.7	22.2
19	31.7	22.2	33.3	21.5	31.5	21.8	31.5	20.3	33.3	22.5	30.4	20.5	33	23.8	28.5	21.6
20	30.9	21.3	31.3	21.1	30.6	22.1	32.9	19.6	34.5	21.2	30.5	19.5	33.2	24.7	28.1	21.1
21	31.5	20.6	31.8	21.6	30.5	21.2	33.7	18.5	34.3	20.8	29.6	19.5	32.5	23.2	27.5	20.1
22	31.6	20.7	31.1	22.1	29.7	22.5	30.9	21	33.9	22.3	31.2	20.1	32.2	24	28.6	21.4
23	30.9	21.7	34.6	21.6	31.4	21.2	32.2	19.7	33.8	21.3	30.3	20.3	31.6	23.9	28.2	21.2
24	31.7	22.47	32.1	21.1	30.6	21.4	32.2	20.4	34.3	21.4	30.4	19	32.1	24.5	28.3	21.2
25	31.4	22.4	31.8	21.1	30.1	21.5	32.7	21.3	34.7	22.6	30.2	21.5	32.5	22.9	25.7	21
26	31.1	25.1	34.2	22.5	32.1	23	32.9	20.5	34.2	22.8	30.5	20.4	33	25.3	28.2	20.2
27	32	22.7	34.1	21.5	31.8	22	31.5	22.2	34.7	21.9	30	21.4	30.1	23.9	27.2	22.4
28	31	22.7	31.6	23.1	29.9	24.5	34.2	20.6	33.9	22.2	28.5	23.2	27.6	22.4	26.5	22.2
29	29.8	23.8	30.1	22.8	29.7	23	33.2	20.6	32	20.8	29	22.5	30.1	22.1	26.6	20.9
30	30.6	24	33.9	21.6	32.1	22.3	33.7	20	33.8	19.8	29.9	21.2	30	23.4	25	22.2
31	33.1	21.5	33.9	22.6	31.6	23	33.3	21.5	34.8	23.4	30	21.6	28.3	23.5	26.7	21.1
Mean	31.5	22.1	32.4	21.7	30.6	22.4	31.6	20.7	33.6	21.7	30.2	21	31.3	23.9	27.8	21.7

Date.	Dumaguete.		Yap, W. Carolines.		Maasin.		San Jose Buenavista.		Cuyo.		Borongan.		Masbate.		Romblon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30	25.6	30.7	25	30.1	23.9	31.8	21.6	31.1	25.4	30.4	23.1	29.6	24	32.5	23.8
2	29.3	24.8	29.7	23.2	30	23.6	30.9	23.5	29.9	25.8	30.1	22.4	29.5	23.5	32.7	24
3	30.1	23.1	30.7	23.6	30	22.6	30.8	19.8	29.5	25.4	30.1	23.6	30.2	24.4	31.7	22.9
4	29.3	24.7	30.3	25.5	30	23.2	29.9	23	28.6	25.8	27.9	23	25.8	22.6	27.7	23.5
5	29.4	23.3	30.2	24	30.5	24.4	30.8	21.6	29.1	26	26.7	23.6	27	24	30.9	23.6
6	29.2	24	30.8	23.3	30.6	22.8	29.8	21.5	29	25.3	29.2	23.1	28.6	22.6	31.4	23.1
7	29.4	23.1			30.4	22.9	30.7	20.2	28.6	25	26.9	23	27.5	24	32.5	22.2
8	30.1	24.9			29.6	23	29.9	22.5	29.2	25.6	29.9	22.4	28.5	24.2	31.6	23.6
9	29.8	24.7	30.4		29.5	23	31.7	23.6	29.6	25.5	30.1	22.6	27.8	25.2	31.8	23.8
10	30.3	25.6	31	23.5	31	24.1	30.4	23	29.7	25.8	29.8	23.6	30.2	25	32.8	24.7
11	29	22.9	31.2	24.1	30.7	22.5	30.8	20.4	30.2	25	30.2	20	30	23.4	32.5	24.2
12	29	22.5	30.7	24.4	30.4	22	29.8	18.5	29.6	22.4	30	19	29.8	22.8	32.6	22.8
13	30	22	30.7	24.7	31.2	21.6	28.4	17.6	30.1	21.5	29.6	19.5	29.8	22.6	32.9	22
14	29.8	22.6	30.8	24.1	29.8	21.9	30.2	20.1	29.9	23.9	30.3	21.5	30.2		33.5	22
15	29.8	21.3	31.2	24	30	22.7	30.3	20	30	24.3	29.7	21.1	29.8	24	33.1	21.5
16	29.8	22.5	31.6	24.4	30.1	21.6		20.3	31	24.1	29.6	20.3	30.6	23	31.8	22.9
17	29.8	21.3	32.2	22.5	30	21.7		19	31.4	24.3	30.1	19.2	30.8	23.2	33.2	20.6
18	29.2	21.4	32.3	23.2	30.2	21.6		20.5	30.2	23.2	29.6	22.3	30.4	24	32.2	21.4
19	29.5	22.3	32.1	23.5	30.4	21.5		20.8	30.2	25	30.2	19.3	29.5	23.6	32.3	22.3
20	30.2	22.7	30.6	23.6	31	21.4		20.5	30.6	24.9	30.1	22.3	30.4	23.2	33	22
21	29.8	23.5	30.2	23.1?	31.1	22		21	30.3	23.5	30.6	19.5	30.2	22.6	33.3	21.4
22	30	24.4	30.8	24	31.3	22		19.8	30.6	24.3	30.3	20	30.6	23.4?	33.1	20.9
23	29.8	22.9	31.6	24.3	31.4	22		18.9	30.4	25.4	30.3	20.8	30	24.8	33.2	22.7
24	29.5	22.7	31.5	23.9	31.3	21.9		22.1	30.1	25.5	30.1	20.8	30.2	23.4	32.7	22.4
25	30.6	22.7	31.4	24.6	31.2	22		21.4	30.1	25.4	30.6	20.7	28.6	23.6	30.4	23.4
26	28.5	23	31.8	24.4	31.2	21.6		21.5	29.5	25.4	30.1	22	29.2	23.8?	32	23.5
27	28.1	22.8	31.1	23.5	29.6	21.6		21.5	28.6	24.9	28.5	21.9?	28	23.8	31.7	22.1
28	27.3	22.1	31.7	24.2	29.4	21.6		20	28.4	24.1	29.1	21.5		23.4	30.7	21.8
29	27.1	20.6	29.9	21.9	27.5	21.4		22.6	27.7	24.5	27	22.5		23.8	32.5	22.9
30	27.5	22.5	30.7	22.5	28.2	21.4		22.5	28.6	24.9	28.3	22.2?		23.5	27.8	23.4
31	28.1	21.6	29.8		28.1	21.2		21.8	29.2	24.6	29.1	21.5?		24.4?	32	21.8
Mean	29.3	23	31	23.8	30.2	22.3	30.4	21	29.7	24.7	29.5	21.6	29.4	23.7	32	22.7

Maximum and minimum temperatures for third-class and rain stations, January, 1913—Continued.

Date.	Laoang.		Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	27.9	22.1	28.7	23.7	28.6	23.8	30.5	23.5	29.8	22.5	30.9	21	31		27.5	19.5
2	29.8	20.4	28.1	23	28.2	23.4	30	23.1	30.2	22.2	30.2	21	30.1		27.2	18.8
3	30	21.7	29	24	29.4	23.2	29	23	31	22.4	29.5	19.2	29.7		27.8	19.1
4	29.7	21.27	26.7	24.5	28.2	25	29	24.5	29.5	23.2	27.4	21.5	30.8		28.3	19.6
5	28.8	21.83	28.5	23.4	28.4	24	30.1	25.2	29.5	23	30	22.5	31.4		28	19.2
6	29.3	21.27	28.9	24.9	28.4	24	29.6	23.2	30.4	20	30.9	17.5	30		28.4	19.5
7	29.7	21.5	26.2	22.8	29	24	29.8	22	29.4	22.1	30	20.4	30.3		28.8	19.6
8	27.9	20.1	28.9	23.8	29.4	24	29.2	23.5	30.3	21	30.9	21	31.7		29.1	20
9	29.7	21.1	27	23.8	28.6	24	29.9	24.5	30.1	22.1	30.2	22	31.8		28.8	20.1
10	30	21.4	29	25.1	30.4	23.6	29.5	23.1	30.6	22	31.5	22.1	28.3		29	19.5
11	30.2	18.7	29.7	24.9	29	21.4	30	24.1	30	20.7	31.5	20.1	29.9		27.8	19
12	30.5	17.5	29.8	24	28.4	23.6	28.7	24	30.4	21.2	30.2	20	28.6		27.1	19.3
13	30.5	18.2	29.7	21.6	28.4	24	29.7	20.8	30.6	21.8		19	30.3		29	19.6
14	29.4	18.2	29.3	22.5	28.6	24.4	30	20	31.5	21			31.4		30.2	20.3
15	31	20.9	29.3	23.5	29.4	24.4	30.3	19.8	30.6	21.9			31		30.7	20
16	30.5	18.9	29.6	22	28.8	24	29.8	22.1	31.1	20			31.8		30.5	19.5
17	30.6	18.3	29.2	20.9	30	23.4	30.1	21.2	31.5	19			30.7		31.1	19.1
18	30.6	19.4	29.4	21.8	29	22.4	29.7	21.5	30	19.9			30.8		31.5	19.6
19	31.1	19.4	28.9	21.9	29	23.4	30.4	20.8	29	19.4			31.7		30	19.8
20	31.1	19.5	30.1	22.5	28	24.4	29.5	22	31.2	19.3			30.3		30.3	19.6
21	31.2	18.5	29.2	22.3	27.2	24.2	30	21.6	31	19.3			30.8		30.7	20.1
22	31.4	18.7	29.9	23.2	27	24	30.5	20.6	30.5	19.1	33	17.5	31.5		30.9	20
23	31.1	20.2	29.9	21.6	28.2	24	30.5	23.7	30.8	19.4	30.5	18.8	32.4		31.5	20.3
24	31.2	20.2	29.2	23.3	28	23.4	27	23	30	20.8	30.1	18.7	26.3		30.5	19.6
25	30.6	19.7	30	23.1	27.4	24	27.5	22.1	31.2	20.2	28.5	20.3	28.1		31.2	19
26	31.6	20.5	29	23.5	28	23.4	28	22.8	29.5	20.7	28.8	21.5	29.3		29.9	18.8
27	29.7	20.6	27.4	22.5	28.6	23.4	28.1	22.7	29.6	20.1	28.7	20.3	29		29.1	18.2
28	29.1	20.3	27.7	22	26	23.4	27.1	20.2	30.7	20	28.7	19.5	30		28.6	18
29	29.4	21.4	28.5	23	28.2	23.4	29.3	20.6	30.5	21	30.9	18.3	29.3		28.8	18.2
30	28.8	20.7	27.2	22.9	27.8	23	28	22.5	30.7	21.5	29.1	21.4	30.8		28.3	18
31	29.6	20.2	27	23	28	23.4	28.8	22	30.4	21.6	30	21.6	29.8		28	18
Mean	30.1	20.1	28.7	23.1	28.4	23.7		22.4	30.4	20.9	30.1	20.2	30.3		29.3	19.3

Date.	Santa Cruz, Laguna.		Antipolo.		Iba.		Tarlac.		Baler.		San Fernando, Union.		Echague.		Candon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	26.3	22.5	25.4	21.3	29.2	21.3	29.5	22.5	25.4	22.3	30	22.7	24.3	21.1	30.5	23.2
2	29.2	21.7	30.8	20.2	32	21.6	31.6	21.4	28	20.7	29.5	22.8	27.6	21.4	28.9	24.1
3	28.9	21	30.8	20.5	30.9	19.9	32.2	21	28.7	21.8	30.8	21.9	30	21.5	30	22.8
4	29.6	23.2	30.7	20.7	30.9	20.3	33	22	29.5	22.6	28.9	22.1	29.8	22	28.5	22.6
5	29.8	22.4	30.3	20.9	33.4	20.5	31.5	21.1	27.2	23.5	31	22.7	26.8	21.5	29.5	24
6	29.1	21.2	29.3	20.5	31.6	22	30.2	21.5	26.1	20.8	26.9	22.3	24.8	20.6	27.6	22.5
7	29.4	19.5	30.8	19.1	31	19	31.4	18.9	29.2	19.5	29.8	21.5	28.9	20	28.5	23
8	30.4	21.5	30	20.4	30.8	19	33.2	18.7	28.8	22.1	29.9	20.5	30.6	21.6	28.6	21.2
9	30.5	22.9	30.7	20.6	31.2	19.3	33.9	21.2	29.7	20.7	29.6	21.1	31.2	20.9	29.3	22.2
10	28	23.1	29.8	20.6	31.2	21.9	31.3	22	28.1	22.7	30.5	22.1	26.6	22.2	29.3	22.8
11	29.4	23.2	26.8	22	27.5	22.5	30.2	21.7	24.5	21.9	29.3	24.2	22.7	20.7	28.9	24
12	29.8	22.2	29.9	20.1	30	20.1	31.4	20.7	24.7	21.3	29.5	22.4	26.3	19.7	28.9	23.5
13	31.3	21.3	31.1	20.9	32	20.7	32.7	20.4	27.2	21.5	29.9	21.6	31.5	20.5	28.4	23.4
14	31	20.1	31.4	19.4	30.4	18.6	32.2	19	28.7	20.8	30.7	22.4	29.8	21.5	28.9	23.4
15	29.9	20.5	31.4	19.7	30.2	19.9	33.6	20.6	28.9	21.7	29.5	21.9	30.4	21.4	29.6	24.1
16	30.5	22.5	31.8	20.8	30.3	19.5	33.7	20.7	29.2	21.8	30.1	21.3	31.3	21.7	29.3	21.8
17	31.6	21.1	31.3	21.8	30.6	19.7	33	19.6	29.5	21.4	30.2	18.8	29.8	21.1	28.9	20.4
18	30.5	21.4	30.7	20.7	30.5	17	31.3	19.4	28.7	21.4	29.4	18.6	29.8	20.6	27.9	19.5
19	30.4	20.3	30.8	19.4	29.7	17.1	32.2	17.3	29.1	21.2	28.7	18.5	26.8	19.5	28	19.2
20	29.4	21.7	30.5	19	29.6	17.8	33.3	18.4	27.7	21.7	29.8	19.2	28.9	19.8	28	19.4
21	31.9	20.4	32.2	19.5	30.1	19.4	33.4	21.6	29	21.4	30	19.7	31.8	19.6	28.7	19.1
22	30.7	22.2	31.3	20.7	31.2	19.1	33.4	20	29.7	22.1	30.3	21.1	29.3	21.9	29.1	20.5
23	29.6	21.6	30.8	20	31.4	18.6	33.3	19.4	28.2	21.2	30.9	18.8	27.1	21.4	29.3	20.7
24	26.5	22	28.5	21.5	31	20.3	33	19.4	27.2	22.5	30.5	19.4	29	21.3	29.2	20.7
25	27.3	21.6	29.2	20.3	29.2	21.6	29.8	21.6	28.7	22.4	28.9	22.2	26.7	21	28.4	22.8
26	26.7	21.2	30.2	20.1	29.3	20	31.8	19.4	28.1	20.5	29.4	20.9	24.5	19.2	29	20.5
27	27.3	20.9	29	18.2	29.5	18	31.1	19.4	27.7	18.3	28.3	20.8	25.4	17.9	27.8	20.2
28	28	19	29.1	18.1	31.6	20	31.5	16.4	28.1	19.6	28.7	18.6	28	18.2	29.3	20.2
29	28.4	20.6	29.4	17.9	30.5	15.6	31.2	17	28.5	20.7	29.1	17.4	27.3	18.7	28.5	18.1
30	28.3	21.1	30	19.1	30.4	17	33	17.5	28.5	21.1	30	18.6	24.3	19.2	29.7	20
31	27.1	21.5	29.2	20.5	31.9	23.5	31.2	17.4	26.7	20.5	29.8	19.6	25.3	18.3	28.6	20.5
Mean	29.3	21.5	30.1	20.1	30.6	19.7	32.1	19.9	28	21.3	29.7	20.8	28	20.5	28.9	21.6

Maximum and minimum temperatures for third-class and rain stations, January, 1913—Continued.

Date.	Laoag.		Sto. Domingo, Batanes.		Date.	Laoag.		Sto. Domingo, Batanes.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.		°C.	°C.	°C.	°C.
1	31.2	23.7	22.6	19	18	28	18	25.9	20.5
2	32.6	22.7	24.6	19.2	19	30.3	17.7	23.9	16.2?
3	30.5	21.5	23.6	20.5	20	30.4	17.5	26.6	18.7
4	31.4	20	23.9	20	21	30.4	20.3	27	21
5	31.4	22.2	21.5	17.4	22	31.5	17.9	26	18.7
6	31.9	20	23.5	17.9	23	32.5	17.9	25.8	20.6
7	30.9	20.1	24.4	18	24	30.5	19.5	27	19.7
8	30.2	20	28	20.4	25	28.3	19	23.3	18.5
9	30.8	19.5	24.4	20.9	26	27.9	19.9	21.3	15.6
10	33.5	20	26.5	19.5	27	30.9	17.7	22.5	15.4
11	32.3	21	26	18.5	28	30.1	15.2	24	16.6
12	30.8	22.1	26	18.6	29	31.1	15.5	25.4	17.9?
13	30	22.6	24.2	18.4	30	29	20.9	22.9	14.6?
14	30.3	19.7	27.9	19	31	31	18.2	23.2	15.6?
15	31.5	20.2	27.9	17.9					
16	30.3	19.1	27.4	17.5	Mean	30.7	19.5	25	18.5
17	30.3	16.3	27	20.8					



# SEISMOLOGICAL BULLETIN FOR JANUARY, 1913.

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## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

4, 22<sup>h</sup> 31<sup>m</sup> [5, 6<sup>h</sup> 31<sup>m</sup>]. Baguio (W Luzon). Earthquake of intensity III. It was more perceptible in the towns of the east of the province than in the Observatory, and hence its epicenter was towards the river Agno valley.

7, 15<sup>h</sup> 27<sup>m</sup> [7, 23<sup>h</sup> 27<sup>m</sup>]. Baguio (W Luzon). An oscillatory, trepidatory shock of intensity III, which was felt throughout the S and E of the Province of Benguet.

9, 8<sup>h</sup> 30<sup>m</sup> [9, 16<sup>h</sup> 30<sup>m</sup>]. Sarangani (S Mindanao). Earthquake of intensity III.

10, 10<sup>h</sup> 28<sup>m</sup> [10, 19<sup>h</sup> 58<sup>m</sup>]. Guam (Mariana Islands). Earthquake of intensity III.

13, 12<sup>h</sup> 16<sup>m</sup> 00<sup>s</sup> \* [13, 20<sup>h</sup> 16<sup>m</sup> 00<sup>s</sup>]. Laoang (NE of Samar). Oscillatory earthquake of intensity III and duration 4 seconds, direction SSE-NNW.

15, 11<sup>h</sup> 46<sup>m</sup> 26<sup>s</sup> \* [15, 19<sup>h</sup> 46<sup>m</sup> 26<sup>s</sup>]. Legaspi (SE of Luzon). Oscillatory earthquake of intensity III and duration 6 seconds, direction N-S.

16, 23<sup>h</sup> 44<sup>m</sup> 34<sup>s</sup> \* [17, 7<sup>h</sup> 44<sup>m</sup> 34<sup>s</sup>]. Western Luzon. Earthquake of intensity IV-V, which was felt throughout all the region of Zambales and in the Provinces of Pangasinan, Tarlac, Pampanga, Nueva Ecija, Bulacan, Rizal, Cavite, and La Laguna, which represents an area within the Island of Luzon of 280 by 150 kilometers. Its origin seems to have been in the China Sea at a short distance from the coast of Zambales. It is not very probable that it was intense in the epicenter, nor that the hypocenter was a very deep one, for it was registered only by the seismographs of Manila and Baguio.

26, 8<sup>h</sup> 15<sup>m</sup> 07<sup>s</sup> \* [26, 16<sup>h</sup> 15<sup>m</sup> 07<sup>s</sup>]. Nueva Caceres (SE Luzon). Earthquake of intensity II-III.

29, 1<sup>h</sup> 45<sup>m</sup> [29, 9<sup>h</sup> 45<sup>m</sup>]. Sarangani (S Mindanao). Earthquake of intensity III.

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance was registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observers who sent the reports. All time indications are in Greenwich mean time (Midnight=0<sup>h</sup>), insular time being added in brackets for the convenience of Philippine readers.

## RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0 h. Instrument: Wiechert seismograph; 1,000 kilograms.  $A_N$ :  $T_0=7.3$ ,  $\epsilon=3$ ,  $\frac{r}{T_0^2}=0.027$ ;  
 $A_E$ :  $T_0=7.8$ ,  $\epsilon=3$ ,  $\frac{r}{T_0^2}=0.040$ . Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
1	4	I <sub>d</sub>	eP F	h. m. s. 17 14 00 17				
2	5	I <sub>d</sub>	eP F	5 27 22 30				
3	5	I <sub>d</sub>	eP L M <sub>E</sub> F	9 42 15 42 29 42 38 46	1-2		48	
4	5	II <sub>r</sub>	eP S <sub>N</sub> S <sub>E</sub> L <sub>N</sub> L <sub>E</sub> M <sub>E1</sub> M <sub>N1</sub> M <sub>E2</sub> M <sub>N2</sub> M <sub>N3</sub> M <sub>E3</sub> M <sub>N4</sub> F	17 24 24 28 56 29 00 31 50 31 58 34 47 35 10 37 18 37 58 40 14 40 25 43 44 18 21	6 6 12 9 10 11 11-12 16 13 12 12		39 46 52 53 56	
5	6	I <sub>d</sub>	eP L M <sub>N</sub> F	0 34 02 34 17 34 23 38	1	47		
6	6	I <sub>d</sub>	eP F	6 49 44 51				
7	7	I <sub>d</sub>	eP L F	20 48 00 48 05 50				
8	7-8	II <sub>r</sub>	eP S L M <sub>N1</sub> M <sub>E1</sub> M <sub>N2</sub> M <sub>E2</sub> M <sub>N3</sub> F	22 53 33 55 24 57 29 59 28 23 01 28 02 04 04 42 05 16 0 30				Formosa.
9	8	I <sub>r</sub>	eP S L M <sub>E</sub> M <sub>N</sub> F	19 19 28 21 14 22 26 26 33 27 09 20 17	11 9-10		69 40	Formosa.
10	8-9	I <sub>r</sub>	eP L F	23 36 20 40 16 0 24				Formosa.
11	9	II <sub>r</sub>	eP S L M <sub>N</sub> F	2 57 43 59 41 3 01 24 15 56 ?	6-7 8		448	Formosa. E-W pen out of order. End overtaken by following earthquake.
12	9	I <sub>r</sub>	e	3 33 43				Formosa. End overtaken by following earthquake.
13	9	I <sub>r</sub>	e F	4 08 5 30				Formosa.
14	9	I <sub>r</sub>	eP S L F	6 13 24 15 22 17 20 47				Formosa.
15	9	I <sub>r</sub>	eP F	11 14 50 49				Formosa.
16	9	I	e F	12 41 48 51				

## Records of the Microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
17	9	I <sub>d</sub>	e F	h. m. s. 13 49 00 56				
18	9	I	e F	14 03 14				
19	9	I	eP S L M <sub>E</sub> M <sub>N</sub> F	14 51 56 53 25 55 05 55 30 56 02 15 10	9-10 7	67	46	
20	10	I <sub>r</sub>	eP S L M <sub>E</sub> M <sub>N</sub> F	7 37 10 39 08 41 06 41 23 42 40 8 25	9 8-9	43	41	Formosa.
21	11	II <sub>r</sub>	eP S <sub>N</sub> S <sub>E</sub> L <sub>N</sub> L <sub>E</sub> M <sub>E</sub> <sup>1</sup> M <sub>N</sub> <sup>1</sup> M <sub>E</sub> <sup>2</sup> M <sub>N</sub> <sup>2</sup> M <sub>N</sub> <sup>3</sup> M <sub>N</sub> <sup>4</sup> M <sub>E</sub> <sup>3</sup> M <sub>N</sub> <sup>5</sup> M <sub>E</sub> <sup>4</sup> F	13 20 03 22 44 22 46 25 06 25 46 26 24 26 28 30 14 30 23 31 30 34 36 35 24 38 17 38 21 15 15	5 6-7 6-7 8-9 14 15 13-14 13 10-11 14 11 11	1,111 1,207 1,031 1,034 621 517 822 480 842		
22	11	I <sub>d</sub>	eP F	17 39 53 43				
23	13	I <sub>r</sub>	eP F	12 16 00 23				Laoang (NE of Samar).
24	13	I	eP L M <sub>E</sub> F	15 25 00 27 50 28 52 46	6-7		24	
25	13	I <sub>d</sub>	eP F	22 34 01 36				
26	14	I <sub>d</sub>	eP L F	8 56 09 56 25 59				
27	15	I <sub>r</sub>	e F	2 16 45 27				
28	15	I <sub>v</sub>	eP L M <sub>E</sub> F	11 46 26 47 07 47 26 58	2		15	Legaspi (SE of Luzon).
29	15	I <sub>r</sub>	e F	19 11 39				
30	16-17	II <sub>v</sub>	eP F	23 44 34 0 13				W of Luzon. Early phases and maximum lost by pens being thrown off through force of shock.
31	19	I <sub>r</sub>	eP S <sub>N</sub> S <sub>E</sub> L <sub>N</sub> L <sub>E</sub> M <sub>N</sub> F	17 12 42 16 09 16 16 19 45 20 02 29 57 18 17	7 6-7 8-9 8-9 12-13	141		
32	19-20	I <sub>r</sub>	eP F	23 55 49 0 17				
33	22	I <sub>r</sub>	e F	3 11 24				Formosa.
34	22	I <sub>d</sub>	eP F	4 41 07 43				

*Records of the Microseismograph—Continued.*

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> u	
35	23	I <sub>r</sub>	e F	h. m. s. 14 08 26				
36	25	I <sub>d</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	12 10 28 11 01 11 05 11 12 15	  2 2	103	32	
37	26	I <sub>v</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	8 15 07 15 32 15 34 15 34 21	  2 2	138	124	Nueva Caceres (SE of Luzon).
38	26	I <sub>d</sub>	eP L F	17 21 55 22 02 25				
39	28	I	e F	4 34 40				
40	28	I <sub>r</sub>	e F	9 09 52 25				
41	28	I	e F	9 34 44 41				
42	29	II <sub>d</sub>	eP L F	4 17 32 17 51 24				Maximum lost by pens being thrown off through force of shock.
43	29	I <sub>d</sub>	eP F	13 50 42 53				
44	30	I <sub>d</sub>	eP F	16 43 34 47				



TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

4, 22<sup>h</sup> 31<sup>m</sup> [5, 6<sup>h</sup> 31<sup>m</sup>]. Baguio (W de Luzón). Temblor de intensidad III. Fué mas perceptible en los pueblos del E de la provincia que en el Observatorio, por consiguiente su epicentro se hallaba hacia el valle del rio Agno.

7, 15<sup>h</sup> 27<sup>m</sup> [7, 23<sup>h</sup> 27<sup>m</sup>]. Baguio (W de Luzón). Temblor oscilatorio y susultorio de intensidad III, sentido en toda la parte S y E de la Provincia de Benguet.

9, 8<sup>h</sup> 30<sup>m</sup> [9, 16<sup>h</sup> 30<sup>m</sup>]. Sarangani (S de Mindanao). Temblor de tierra de intensidad III.

10, 10<sup>h</sup> 28<sup>m</sup> [10, 19<sup>h</sup> 58<sup>m</sup>]. Guam (Islas Marianas). Temblor de tierra de intensidad III.

13, 12<sup>h</sup> 16<sup>m</sup> 00<sup>s</sup> \* [13, 20<sup>h</sup> 16<sup>m</sup> 00<sup>s</sup>]. Laoang (NE de Sámar). Temblor oscilatorio, dirección SSE-NNW, intensidad III, duración 4 segundos.

15, 11<sup>h</sup> 46<sup>m</sup> 26<sup>s</sup> \* [15, 19<sup>h</sup> 46<sup>m</sup> 26<sup>s</sup>]. Legaspi (SE de Luzón). Temblor oscilatorio, dirección N-S, intensidad III, duración 6 segundos.

16, 23<sup>h</sup> 44<sup>m</sup> 34<sup>s</sup> \* [17, 7<sup>h</sup> 44<sup>m</sup> 34<sup>s</sup>]. W de Luzón. Temblor de tierra de intensidad IV-V, sentido en toda la región de Zambales y en las Provincias de Pangasinán, Tárlac, Pampanga, Nueva Ecija, Bulacán, Rizal, Cavite y La Laguna, que representan un área dentro de la Isla de Luzón de 280 kilómetros de largo por 150 kilómetros de anchura. Su origen se hallaba al parecer dentro del mar de la China a poca distancia de las costas de Zambales: no es probable que en el epicentro tuviese mucha intensidad, ni que el hipocentro estuviese muy profundo, puesto que solamente lo registraron los seismógrafos de Manila y Baguio.

26, 8<sup>h</sup> 15<sup>m</sup> 07<sup>s</sup> \* [26, 16<sup>h</sup> 15<sup>m</sup> 07<sup>s</sup>]. Nueva Cáceres (SE de Luzón). Temblor de tierra de intensidad II-III.

29, 1<sup>h</sup> 45<sup>m</sup> [29, 9<sup>h</sup> 45<sup>m</sup>]. Sarangani (S de Mindanao). Temblor de tierra de intensidad III.

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.



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## BULLETIN FOR FEBRUARY, 1913.



# METEOROLOGICAL BULLETIN FOR FEBRUARY, 1913.

By Rev. JOSÉ CORONAS, S. J.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

Pressure and temperature.—The mean atmospheric pressure of the month differed but little from that of February last year. In Manila the difference from the normal of the month was + 0.13 mm. The highest pressures were recorded on the 1st or the 16th; the lowest on the 22d or 23d.

The mean monthly temperature was also very like that of February of last year, as there were only three stations in which there was a difference greater than 0.5°C. The extremes in Manila were 33.4°C on the 16th, and 17.8°C on the 25th.

### PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR FEBRUARY, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from Feb., 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from Feb., 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		°C.	°C.	°C.		°C.	
Tagbilaran	760.31	—0.14	762.89	16	758.37	22	25.4	0	34	18	18.2	8
Surigao	60.25		62.88	16	58.53	23	25.6		32.6	11	18.5	11
Cebu <sup>1</sup>	60.87		62.96	15			26				22.4	1
Iloilo	60.12	— .29	62.88	16	57.96	22	26.2	— .2	31.9	21	21.5	18
Ormoc	60.60	— .11	63.28	16	58.72	23	25.6	+ .1	32.2	7, 25	18.8	11
Tacloban	60.98	— .07	63.44	16	59.15	23	25.5	— .2	32	18	21.7	11
Capiz	60.88	— .37	63.48	1, 16	58.60	22	25.7	— .5	31.4	10, 11, 22	20.9	18
Calbayog	60.85	— .21	63.34	16	58.92	23	24.9	— .4	32.9	23, 26	18.7	18
Legaspi	61.35	— .19	64.16	1	59.19	23	26	— .1	32	28	18.4	10
Atimonan	61.68	— .07	65.07	1	59.19	23	25.4	— .3	30	16	20.4	15
Paracale	61.98	— .03	65.32	1	59.49	23	25.3	— .1	30.8	28	20.6	8, 15, 26
Manila	61.42	— .04	64.57	1	58.86	23	25	— .3	33.4	16	17.8	25
San Isidro	61.61	— .09	64.98	1	59.01	23	25.3	— .4	34.9	25	17	20
Dagupan	60.82	— .33	64.05	1	58.27	23	26.1	+ .3	36.3	22	18.1	1
Bolinao	60.96	— .23	64.04	1	58.34	23	26.4	+ .7	33.8	21, 25	19.1	1, 12, 18
Baguio <sup>2</sup>	638.10	— .02	640.38	1	636.46	23	17	— .2	26.5	21	11	2
Vigan	761.06	— .37	764.18	1	758.34	23	26	+ .8	32.6	22	18.8	3
Tuguegarao	62.53	+ .05	67.28	1	59.04	23	23.9	— .8	34.9	22	16.6	19
Aparri	62.64	+ .21	67.64	1	58.78	23	23.6	0	32.7	22	18	1, 2

<sup>1</sup> 22 days of observation.

<sup>2</sup> The barometric readings of this station are not reduced to sea level.

Rainfall.—Comparing the total rainfall of the month with that of the corresponding month last year, we find that in 18 stations it was less and in 27 stations more. Nevertheless, taking the normal of February as the basis of comparison we find that there were very few stations with a positive difference, so that it may be said that there was a scarcity of rain during the month throughout the whole of the Archipelago. In Manila as well as in Tarlac, Candon, Vigan, Laoag, and ~~San Jose de Buenavista~~ there was no rain at all during the month.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF FEBRUARY, 1913.

Station.	Total.	Departure from Feb., 1912.	Departure from normal.	Rainy days.	Departure from Feb., 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from Feb., 1912.	Departure from normal.	Rainy days.	Departure from Feb., 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.		mm.				mm.	mm.	mm.			mm.	
Jolo	153.4	84	+ 54.6	10	+ 8	99.6	20	Calapan	85.1	+29.9		18	- 5	15.2	21
Isabela, Basilan	31.3	+ 2.5		4	0	24.4	28	Virac	100.2	-50.4		13	- 5	34.8	5
Zamboanga	10.7	- 7.7	- 45.9	1	- 1	10.7	28	Nueva Caceres	16.7		-74.4	6		6.6	8
Davao	40.7	-25.2	- 98.3	3	0	24.9	14	Batangas	4.6	- 4.1		4	+3	2	1
Cotabato	87.5	-61.9	- 7.6	10	+2	29.2	19	Atimonan	64.2	+ 9.6	-60.2	15	0	11.1	20
Cagayan, Misamis	27.2	-13.9		4	+1	12.5	19	Silang	17.5	- 4.8		6	+2	9.4	7
Dapitan	121.4		-12.5	14		17.5	1	Paracale	209.4	-64.9		17	0	42.3	5
Butuan	204.3	-53.7	-39.8	17	-4	50	13	Sta. Cruz, Laguna	24.3	-10.9		14	+4	10.9	20
Dumaguete	65	-21.6		8	-3	21.8	3	Manila	0	-24.6	-10.5	0	-6	0	0
Yap, W. Carolines	84.2	-18.3		14	-1	29.8	16	Antipolo	.8	-29.2		1	-3	.8	26
Tagbilaran	38.2	-117.8	- 72.5	8	-1	12.7	3	Iba	10.2	- 6.4		1	-2	10.2	10
Surigao	363.6	-165.9	-36.6	22	+2	66.5	19	San Isidro	.6	- 3.3	- 4.6	2	-1	0	8,26
Maasin	196.9	-52.2	-47.9	5	-5	67.1	2	Tarlac	0	-18.5	- 9.6	0	-1	0	0
Cebu <sup>1</sup>	49.3							Baler	105.8	+24.1		20	+5	35.8	13
Iloilo	15.3	- 4	-12.8	2	-4	14.5	28	Dagupan	12.4	- 4	- 6.6	2	0	10.4	9
San Jose Buenavista	1.8	0		1	-1	1.8	13	Bolinao	1.3	- 1.3	- 4.8	1	-1	1.3	27
Cuyo	1.3	+ 1.3		1	+1	1.3	13	Baguio	40.3	-37.4	-24.9	4	+2	23.6	6
Ormoc	70.9	-19.7	-29.8	11	-3	20.8	21	San Fernando, Union	.6	- 6	- 5.4	2	+2	.3	9,21
Tacloban	317.2	+175.1		13	-3	104.9	13	Echague	6.6	- 3.4		3	-3	3.3	10
Capiz	32	-24.1	- 77.5	8	-1	11.7	24	Candon	0	0		0	0	0	0
Borongan	538	+287.3	-100.2	24	-1	110.5	13	Vigan	0	0	- 1.7	0	0	0	0
Calbayog	156	-42.6	-22.2	17	+2	40.4	12	Tuguegarao	16	-16	- 2.9	4	-4	9.1	22
Masbate	121.5	+15		10	0	36.3	12	Laoag	0	0		0	0	0	0
Romblon	77.5	-10.8		11	-6	21.8	20	Aparri	64.6	+ 8.5	-29.3	9	-1	26	9
Laoang	269.2	-86.7		22	-3	112.5	12	Sto. Domingo, Bata-							
Legaspi	182.6	-70	-117.3	16	-2	40.5	5	nes.	158.7	-24.8		13	0	55.1	23
Sumay, Guam	36.8	- 3.9		10	-3	6.4	10								

<sup>1</sup> 22 days of observation only.

## DEPRESSIONS AND TYPHOONS.

As is generally the case during February, there was not a single typhoon nor even a depression of any importance that affected the Islands. Several continental depressions or cyclones crossed Japan, but they had scarcely any influence on the weather of the Archipelago.

## NOTAS GENERALES DEL TIEMPO.

**Presión y Temperatura.**—La presión atmosférica media de este mes difiere muy poco de la media mensual de Febrero, 1912. La de Manila se diferencia de la normal de este mes en  $+ 0.13$  mm. Las mayores presiones ocurrieron generalmente el 1 ó el 16, y las menores el 22 ó 23.

La temperatura media mensual es también muy parecida a la del año pasado, siendo solo tres las estaciones que dan una diferencia mayor de  $0.5^{\circ}\text{C}$ . Los valores extremos registrados en Manila fueron  $33.4^{\circ}\text{C}$  y  $17.8^{\circ}\text{C}$ , y corresponden respectivamente a los días 16 y 25.

**Precipitación acuosa.**—Comparando la lluvia total de este mes con la del año pasado, nos hallamos con un resultado de 18 diferencias negativas contra 27 positivas. Sin embargo, comparada la misma lluvia con la normal de Febrero, hallamos ser rarísimas las estaciones que nos dan diferencias positivas, resultando de ahí que bien puede decirse haber habido falta de lluvia este mes en casi todo el Archipiélago. En Manila, lo mismo que en Tárlac, Candón, Vigan, Laoag y ~~San José de Buenavista~~, no ha habido nada de lluvia en todo el mes.

## DEPRESIONES Y TIFONES.

Como suele suceder en el mes de Febrero, no ha habido en todo el mes ningún tifón, ni siquiera depresión de importancia para Filipinas. A través de Japón cruzaron varias depresiones continentales o ciclones, pero sin influir apenas en el tiempo de nuestro Archipiélago.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>		
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.			Free expo- sure (total).	Shelter (total).	
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.					
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.	
1	764.57	24	29	20.9	25.5	26.6	26.9	27	27.9	28.1	73.8	16.3	2.9	2.7	
2	63.65	23.5	31	18	24.8	26.6	26.8	27	27.9	28	75	15.8	3.7	3.2	
3	62.11	24	31.9	19.8	25.3	27.3	26.8	27	27.9	28	73.7	16.1	3.3	2.8	
4	61.17	23.9	31.3	18.4	24.8	26.9	26.8	27	27.9	28	73.2	15.9	4.2	3.5	
5	61.37	24.1	31.4	18.4	25.5	27.3	26.9	27.4	27.8	27.9	75.1	16.4	4.4	3.5	
6	61.78	24.9	31.4	20.6	26.2	27.5	27.2	27.5	27.9	28	77.6	18	4	2.8	
7	61.56	25.2	31.1	21.4	26.6	28.2	27.4	27.6	28	28.2	77.3	18.3	3.1	2.5	
8	61.10	25.3	31.5	21.2	26.8	27.8	27.6	27.8	27.8	28.1	75.8	17.9	3.3	2.8	
9	61.28	25.1	32.3	19.7	26.5	28.2	27.6	27.8	27.8	28.2	73.6	17.2	3.6	2.9	
10	61.44	25	32.1	19.1	26.5	28.1	27.5	27.8	27.8	28	79.1	18.4	3.2	2.3	
11	62.08	25.1	30.7	21.1	26.8	28.2	27.6	27.8	27.8	28.1	78.4	18.4	3.2	2.8	
12	62.93	24.8	30	21.5	26.6	27.9	27.7	27.8	27.8	28	70.4	16.3	3.9	3.2	
13	62.66	24.9	31.7	20	26.4	27.8	27.6	27.8	27.8	28	76.6	17.7	4	3.3	
14	63.38	24.6	31.2	19.6	26.5	27.9	27.6	27.8	27.8	28	73.9	16.8	3.9	3.4	
15	63.64	24.8	32	18.7	26.1	28.3	27.5	27.8	28	28.2	73	16.7	4.8	3.5	
16	63.72	25.9	33.4	21.8	27.1	28.5	27.8	27.9	27.9	28.2	71.3	17.4	5	4.1	
17	62.34	24.4	30.9	18.6	26.5	28.3	27.7	28	28	28.2	73.7	16.4	4.8	3.7	
18	61.24	24.9	31.7	20.7	26.7	28.7	27.6	28	27.8	28	73.9	17	5.4	3.9	
19	60.78	24.9	32.4	19	26.7	28.6	27.8	28	27.8	28	69.9	16	5.7	4.7	
20	60.13	24.6	31.6	19.2	26.8	28.5	27.9	28.1	27.8	28	74.2	16.9	4.1	3.2	
21	59.66	25.8	31.6	22.2	27.1	29.5	27.8	28	27.9	28	77.5	19	4	3	
22	59.06	26.4	32.5	21	26.9	28.5	27.8	28.1	27.9	28	72.6	18.3	5.5	4.1	
23	58.86	26.1	32.9	20.5	26.7	28.8	27.8	28.1	27.9	28.2	70.2	17.2	7.1	5.4	
24	59.73	25.4	32	20	26.7	28.2	27.9	28.1	27.8	28	70.6	16.8	4.4	3	
25	60.24	25	32.5	17.8	25.7	28.3	27.7	28	27.8	28	68.2	15.8	5.8	4.5	
26	59.68	25.4	32.2	19.5	26.5	28.8	27.8	28.1	27.9	28	72	17.2	5.3	4.2	
27	59.56	25.3	30.4	22.3	27.5	28.8	28	28.2	27.8	28	77.4	18.5	3.6	2.7	
28	60.01	25.5	31.7	20.4	26.7	28.4	28	28.2	27.8	28	75.2	18	4	3.2	
Mean	761.42	25	31.6	20	26.4	28.1	27.5	27.8	27.9	28	74	17.2	4.3	3.4	
Total													120.2	94.9	
Departure from normal	+0.13	-0.3	+0.8	-0.3							+0.1	-0.3			

Day.	Wind.					Clouds.				Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.	
	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.	Amount (mean).	Form and its direction.							
						Upper.	Lower.						
		Km.	Km.		0-10.				h.	m.	mm.		
1	N, E	178.5	15.5	E	8.1	A.-Cu.	Cu.	E	1	35			
2	NNE	133	11	NNE	5	Ci.-S.	Cu.	ENE	6	25		≡ a.	
3	N	150.5	14	N	4.6		Cu.	E	6	05		⊙ a.	
4	NW, SE quad.	177.5	17.5	WNW	2.6	Ci.	Cu.		8	30			
5	E quad.	202	24	SE	4.5	Ci.	Cu.	E	8	50			
6	E quad.	125	16	N	7	Ci.-S., Ci.	Cu.	E	5	25		●° a.	
7	ESE, WSW	109	13	WSW	6.8	A.-Cu.	Cu.	E	6	25			
8	ESE	122.5	18	ESE	8.3	Ci., A.-Cu.	Cu.-N.	E	3	35		d° a.	
9	SE	138.5	14	ENE	7.6	A.-Cu., Ci.-S.	Cu.	E	3	05		d° a.	
10	w, NE quad.	106.5	14	W	7.2	Ci.	Cu.	E	6	30			
11	N quad.	152	16	NNE	9.1	A.-Cu.	Cu.-N.	E	2	55		●° p.	
12	NW quad.	159	14	WSW	8.2	A.-Cu.	N.-cf.	E	3	30			
13	WNW, SE	162	15	WNW	5.8	Ci.	Cu.	E	7	35			
14	SE	168	14.5	SE by E	7.8	Ci.	N.-cf.	E	3	40			
15	SSE	190	18	SE	4.5	Ci.	Cu.	E	9	20			
16	ESE	210	26	SE	4.1	A.-Cu.	Cu.	E	8	15			
17	E	202.5	19	WNW, E	3.8	Ci.	Cu.	E	9	40			
18	E quad.	196	21	SE	7	Ci.-S.	Cu.	E	6	05			
19	NE quad.	214.5	21.5	SE	2.2	Ci.	Cu.	E	9	40			
20	Variable	158	17	WNW	7.4	A.-Cu.	SSE	Cu.	E	3	05		
21	SE	189	20	SE	8.8	A.-Cu.	N.-cf.	E	1	15			
22	SSE	229	25	SSE	3.2	Cu.	Cu.	E	9	30			
23	SE	287	30	SE	1.8	A.-Cu.	Cu.	E by N	9	50		≡° a.	
24	ESE	191	19	E	4	Ci.	Cu.	E	7	15			
25	SE, W	219	18	SSE	1.7	Ci.	Cu.	E	9	10			
26	W, SE	173	18	SE	2.8	A.-Cu.	Cu.		8	35			
27	SE quad.	174.5	24	SE	8.2	A.-Cu.	N.-cf.	E	1	50			
28	E quad.	150.5	14	NNE, ESE	7.3	A.-Cu.	Cu.	E	3	10			
Mean		173.9	18.1		6.6				6	07			
Total		4,868							171	10		0	
Departure from normal		-526.4			+1.7				-27	43		-10.5	

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.



METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.<sup>a</sup>

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=128^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 8 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	762.31	23.5	27	19.6	87	18.8	E	2.2	8.5	Ci.-S.	Cu., Fr.-N. E quad.	6.4	d° a. p.
2.	61.69	25.2	30.2	22.6	82.5	19.4	NE	2.2	7	Ci.-S.	Fr.-Cu. E	12.7	d° a. p.
3.	60.33	24.2	29.1	22.4	93.3	21	E	.7	9.8	Ci.-S.	N., Fr.-N. SE, E	1.3	● a. p.
4.	59.79	25.1	30.9	22	86.5	20.3	E	1	5.2	Ci.	E quad.	2.8	● a. p.
5.	60.12	25.4	31	22.3	86.2	20.6	NE	.3	3.3	Ci.	Cu. SE, E	6.6	● a. p.
6.	60.62	25.3	30.7	20.7	86	20.4	E	.7	4	Ci., Ci.-S.	Cu. ESE	7.1	d° a.
7.	60.56	24.8	31.2	21	84.3	19.4	NE	.8	5.2	Ci.-S.	Cu. SE		● a.
8.	60.16	23.8	30.5	18.2	86.7	19.1	NE	.8	4.5	Ci., Ci.-S.	Cu. E		
9.	60.62	26.1	32.7	22.2	82.2	20.4	E	1.7	3.5	Ci.	Fr.-Cu. SE		
10.	60.71	25.3	31.4	21.2	81.5	19.3	NE quad.	1.5	4	Ci.	Cu. SE		
11.	61.25	25.4	31.2	21.2	80.5	19.2	NE	1	1.3	Ci.	Fr.-Cu. E		
12.	61.20	25	31.6	19	78.7	18.2	E	1	1.5	Ci.	Fr.-Cu. ESE		
13.	61.22	25.3	31.2	21	82.7	19.6	E	1.3	1.8	Ci.	Cu. SE	.8	● a. p.
14.	62.80	25.5	31.4	22.6	81.7	19.8	E	1.7	8.8	Ci.-S.	Cu. E, SE		
15.	62.61	25.6	31.6	21.7	78.8	19	NE	1.3	4.8	Ci.-S.	Cu. E		
16.	62.89	25	32.5	20.7	80.7	18.7	E	1.2	3.2	Ci.	Fr.-Cu., Cu. SE		
17.	61.32	25.5	33.2	20.8	73.5	17.2	NE	1.5	4.3	Ci.	Cu. E		
18.	60.15	26	34	20.7	70.7	17.2	NNE	1.8	3	Ci.	Cu. SE, NE		
19.	59.60	25	30.5	22	85.7	20.1	NE	1.2	7.8	Ci.-S.	Cu. E		d° a. p.
20.	58.61	26	30.7	22.5	81.3	20.2	E	1.5	4.7	Ci.	Cu. E, SE		□ <sup>2</sup> p.
21.	58.73	26.2	32.4	22.2	80.5	20	E quad.	1.7	2	Ci.	Cu. E		
22.	58.37	26	32.3	22.2	77.7	19.2	NE	1.7	1.8	Ci.	Cu. E		
23.	58.44	26	32.4	22.2	82.3	20.5	E	1.8	2	Ci.	Cu. E, SE		
24.	58.49	26.6	32.7	22.8	78.7	20.2	E	.8	4.3	Ci.-S., Ci.	Cu. E		d° a.
25.	59.36	26.4	32.2	22.5	80.5	20.5	E	1	3.3	A.-Cu.	Cu. SE, ESE		
26.	59.06	25	31.2	20.5	84.7	19.8	E	1.5	2.2	Ci.	Cu. E, SE		
27.	58.75	25	30.3	21.3	88.2	20.6	E	1	4.8	Ci.	Cu. ESE, E		
28.	58.79	26	31.3	22.8	83.8	20.8	E	1.3	4.7	Ci.-S., Ci.	Cu. E quad.	.5	d° a. p.
Mean	760.31	25.4	31.3	21.5	82.4	19.6		1.3	4.3				
Total												38.2	

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	761.65	25.1	26.5	22.7	83.7	19.8	ENE	683.1	10	Ci.-S.	Fr.-N.	E	31.2	● <sup>2</sup> a. d <sup>2</sup> p.
2.	60.79	24.5	26.2	22.7	88.3	20.1	ENE	517.6	10	Ci.-S.	Fr.-N.	E	52.5	● a. ● <sup>2</sup> p.
3.	59.98	24.4	26.1	23	94.2	21.3	ENE	318.3	10	Ci.-S.	Fr.-N.	E	62.7	● <sup>2</sup> a. p.
4.	59.57	25.6	31.1	21.3	86.8	21	E quad.	170.2	7.8	Ci.-S.	Cu.-N.	E	4.5	d° a. ● p.
5.	60.01	26.1	30.3	22.2	86	21.4	ENE	171.8	7.3	Ci.-S.	Cu.-N.	E	25.4	● a. p.
6.	60.26	24.1	28.8	20.7	90.3	20.2	ENE	188.5	6.3	Ci.-S.	Cu.-N.	ESE	7.9	d <sup>2</sup> a. ● <sup>2</sup> p.
7.	60.60	25.5	30	21.5	84.8	20.4	ENE	279	4.3	Ci.-S.	Cu.-N.	ESE	7.6	● a. d <sup>2</sup> p.
8.	60.13	24.8	31.7	20.7	86.8	20	ENE	241.3	6.5	Ci.-S.	Cu.-N.	ESE	6.6	d <sup>2</sup> a. p.
9.	60.34	25.5	30.3	21.7	83.8	20.1	E, ENE	257.6	5.5	Ci.-S.	Cu.-N.	ESE	2.6	● <sup>2</sup> d p.
10.	60.45	25	31.2	19.9	83.7	19.4	E quad.	180.5	3.2	Ci.-S.	Cu.	E		
11.	61.22	25.4	32.6	18.5	78.2	18.4	E quad.	264.9	2	Ci.-S.	Cu.	ENE		
12.	61.29	26.1	31.3	19.5	74.2	18.2	E quad.	256.4	3.8	Ci.-S.	Cu.-N.	ENE	2.8	● p.
13.	61.22	25.9	31.3	21.1	78.2	19	ENE	247.4	7.2	Ci.-S.	Cu.-N.	ENE	32	● p.
14.	62.30	25.6	28.1	21.9	80.2	19.4	ENE		10	Ci.-S.	Cu.-N.	ENE		● a.
15.	62.64	26.7	31.4	21.9	78.7	20.2	ENE		6.7	Ci.-S.	Cu.-N.	E		
16.	62.88	25.6	32.3	19.6	75.7	18.2	ENE	269.8	3.7	Ci.-S.	Cu.	E		
17.	61.77	25.8	30.2	21.6	75	18.4	ENE	493.6	5.8	Ci.-S.	Cu.-N.	ENE	3.6	● p.
18.	60.49	26.7	30.1	24.4	73.2	19	ENE	565.1	5.2	Ci.-S.	Cu.-N.	E	4	d a. ● <sup>2</sup> p.
19.	59.46	24.6	29.3	21.9	88.8	20.4	ENE	336.8	10	Ci.-S.	N.	E	66.5	d a. ● <sup>2</sup> p.
20.	58.92	25.1	29.6	21.9	85.8	20.2	ENE	303	9.8	Ci.-S.	Cu.-N.	E	13.5	d° a. ● p.
21.	58.88	26	29.9	21.8	81.7	20.2	ENE	255.5	6.7	Ci.-S.	Cu.-N.	E	5.4	● a. p.
22.	58.59	26.7	31	21.5	76.2	19.5	E quad.	268.9	3.3	Ci.-S.	Cu.-N.	E		
23.	58.53	25.8	31.6	21.6	79.7	19.2	ENE	263.1	5.8	Ci.-S.	Cu.-N.	E	4.1	● <sup>2</sup> a.
24.	58.56	26.2	30.9	22.9	85	21.3	ENE	313.4	7.2	Ci.-S.	Cu.-N.	ENE	8.9	d ● <sup>2</sup> a.
25.	59.59	26.1	30.5	22.3	85.2	21.3	ENE	277.6	8	Ci.-S.	Cu.-N.	E	1.5	● a. p.
26.	59.19	25.9	31.1	20.8	80.8	19.9	ENE	145.9	4	Ci.-S.	Cu.-N.	E	4.3	
27.	58.83	24.7	28.8	21	89.7	20.8	ENE	209.8	9	Ci.-S.	Cu.-N.	ENE	6.8	● a. p.
28.	58.80	27	32.1	21.4	81.7	21.3	ENE	279.5	5.5	Ci.-S.	Cu.-N.	E	9.2	● p.
Mean	760.25	25.6	30.2	21.5	82.7	20		298.4	6.6					
Total													363.6	

<sup>a</sup> All the mean values given in these tables are deduced from six daily observations.

## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	762.50	24.6	26.9	22.4	78.3	17.8	NE quad.	568.7	6.2		Cu.-N. ENE	7.9	☉ a. d a. p. ● p.
2.	61.31	25.8	29	23.5	74.3	18.4	NNE	628.2	6.5	Cl., Ci.-S.	Cu.-N. ENE	6.1	● p.
3.	60.53	23.9	25.6	23	92	20.3	NNE	475.7	9.3		N. NE	26.1	d ● a. p.
4.	59.81	25	27.8	22.8	84.3	19.8	NNE	366.8	6.5	Ci.	Cu.-N. NE	1.3	d ● a.
5.	60.31	26.2	30	22.7	78.2	19.5	NE, NNE	323.8	3.3	Ci.	Cu. ENE		☉ a.
6.	60.72	26.4	29.8	23.7	78	19.8	NE quad.	355.2	5.5	Ci.	S.-Cu. ENE	.8	☉ a. ● p.
7.	60.77	26.7	30	24	71	18.4	N, NE	376.6	2.5	Ci.	Cu. ENE		☉ a. ☉ p.
8.	60.57	26	28.2	23.1	76	18.9	N, NE	336.4	4.8	Ci.	Cu. ENE		☉ a. ☉ p.
9.	60.68	26.8	29.2	22.6	67	17.4	N, NE	347	3.8	Ci.	Cu. ENE	.5	☉ a.
10.	60.89	26.6	30	24	70	18	NE	284.7	3.3	Ci.	Cu. ENE	.5	d a. ☉ p.
11.	61.32	26.1	29.6	22.5	71.7	17.7	NE	264.2	2.2	Ci.	Cu. ENE		☉ a.
12.	61.44	26.6	30	23.7	71.7	18.4	NE	360.1	2.3	Ci.	Cu. ENE		☉ a.
13.	61.42	25.3	27.8	23.2	81.2	19.5	NNE	374.5	6.2		Cu.-N. ENE	4.6	☉ a. ● a. d p.
14.	62.77	26.1	28.6	23.3	78.3	19.6	NE	351.9	6.5	Ci.-S.	Cu.-N., Cu. NE		● a. ☉ p.
15.	62.96	26.5	29.5	24	71.2	18.1	NE	390.3	4.2	Ci.	Cu. ENE		☉ a. ☉ p.
16.	62.91	26.2	29.5	22.7	71.2	17.8	NE	430.6	3	Ci.	Cu. ENE		☉ a.
17.	61.46	26.2	28.8	24	71.3	17.9	NE	464.6	3.2	Ci.	Cu. NE		☉ a. ☉ p.
18.	60.53	26	29.1	23.4	66	16.4	NE	456.7	2.3	Ci.	Cu. ENE		☉ a. ☉ p.
19.	59.61	26	29.8	23.6	71.8	17.9	NE	410.4	5	Ci.	Cu.-N. NE	1	☉ a. ● p.
20.	58.83	26.4	30	24.5	78	19.9	NE	307	6	Ci.-S.	Cu.-N. ENE		
21.	59.03	26.3	30.5	24	78.5	19.9	NE	467.5	3.2	Ci.	Cu., Cu.-N. ENE		
22.	58.84	26.5	29.1	23.9	75.8	19.5	NE quad.	366.1	3.3	Ci.-S., Ci.	Cu.-N. ENE, E	.5	☉ d a.
23.								385.5					
24.													
25.													
26.													
27.													
28.													
Mean	760.87	26	29	23.4	75.3	19.1		395.3	4.5				
Total												49.3	

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. et.	mm.		Km.	0-10.				mm.	
1.	762.26	26.1	28.2	23.3	69.8	17.5	NE	681.5	4.7	Cl., Ci.-S.	Cu.			d p.
2.	61.56	26.3	28.7	23.2	66.8	16.9	N	555.5	4.7	Cl., Ci.-S.	Cu.			
3.	60.32	25.8	27.7	24.4	75	18.6	N	577.8	6.3	Cl.-S.	Cu.			d p.
4.	59.76	25.7	28	23.8	76.8	18.8	N	460.3	5.8	Cl.-S.	Cu.			d p.
5.	59.99	26	28.6	23.7	79.2	19.8	N	411.1	5	Cl., Ci.-S.	Cu.	NE		d a.
6.	60.22	26.8	29.8	23.7	76.3	19.9	NE	350.5	4.7	Ci.	Cu.	NE		☉ a. d <sup>o</sup> p.
7.	60.23	26.9	29.3	24.4	69	18	N, NE	433.2	1.7	Ci.	Cu.			☉ a. ∞ p.
8.	59.99	26.3	29.5	23.1	69.5	17.5	N	344.5	3.2	Ci.	Cu.			
9.	60.21	26.4	29.7	23.4	67.2	16.8	N, NE	417.9	2.3	Ci.	Cu.	NE		
10.	60.50	26.5	30.5	23.1	70	17.8	N, NE	408	2.5	Ci.	Cu.			∞ p.
11.	60.79	26.5	29.2	23.8	73.5	18.8	NE	443.5	3.8	Ci.	Cu.	NE		☉ d a. ∞ p.
12.	61.22	25.4	29.5	23.9	79.5	18.9	N, NE	507	6.7	Ci.-S.	Cu.			d a. ● p.
13.	61.36	25.2	27.5	23.2	80.3	19	N, NE	558.4	9.2	Ci.-S.	S.-Cu.	NE		☉ d <sup>o</sup> a. d p.
14.	62.50	25.9	28.6	23.4	75.5	18.6	N, NE	530	7.7	A.-Cu.	ESE Cu.			● a.
15.	62.62	26.1	29.4	23.6	70	17.5	NE	529	5	Ci.-S., Ci.	S.-Cu.	NE		☉ a. ∞ p.
16.	62.88	25.6	29.7	22.4	72.7	17.4	NE	539.7	2	Ci.	Cu.			☉ a. ∞ p.
17.	61.22	25.8	29.6	23	70.7	17.2	NE	648.8	3.5	Ci.	Cu.	NE	0.8	● a.
18.	60.14	25.6	30.6	21.5	64.3	15.4	N, NE	585.5	1.2	Ci.	Cu.			☉ a. ∞ p.
19.	59.45	25.9	30.3	22.2	69.8	17.1	N, NE	627.9	5.3	Ci.	Cu.	NE		☉ a. d p.
20.	58.30	26.4	30.9	23.4	75.3	19.1	N	543.1	8	Ci.-S.	Cu.	NE		
21.	58.45	27	31.9	23.4	73.5	19.1	NE	550.5	6.3	Ci.	Cu.	NE		d a. ∞ p.
22.	57.96	26.9	30.8	24	73.7	19.1	N, NE	498.5	4.3	Ci.-S.	Cu.			∞ p.
23.	58	26.2	30.9	22.4	71.7	17.8	N, NE	476.2	2.5	Ci.	Cu.			
24.	58.40	26	30.5	23	77.2	19.1	N, NE	484.4	6.2	Ci.-S.	Cu.	NE		☉ p.
25.	59.15	26.8	30.8	23.9	74.8	19.3	N, NE	450	4.2	Ci.	Cu.	NE		∞ p.
26.	58.80	26.2	30.4	23.5	72.7	18	NE	458	1.8	Ci.	Cu.			☉ a.
27.	58.50	25.8	30.2	22	72.7	17.8	NE	432.1	3.5	Ci.	Cu.	NE		
28.	58.62	26.7	31	23.9	71.5	18.4	N, NE	496.6	5.5	Ci.	Cu.	NE	14.5	☉ a. ● p.
Mean	760.12	26.2	29.7	23.3	72.8	18.2		500	4.6					
Total								13,999.5					15.3	

a 22 days of observation.

ORMOC.

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	<i>mm.</i>	<i>°C.</i>	<i>°C.</i>	<i>°C.</i>	<i>P. ct.</i>	<i>mm.</i>		<i>Km.</i>	<i>0-10.</i>				<i>mm.</i>	
1.	762.64	25.5	29.1	22.9	69.5	16.9	NE quad.	245.9	6.8	A.-Cu.	ESE	Cu.-N.	NE	p a.
2.	61.50	25.6	29.1	23.4	74.5	18.6	N	211.9	7.3	Ci.-S.		Cu.-N.	NE	d p.
3.	60.43	25.3	27.9	23	83.5	20	Variable	123.9	8.7	Ci.-S.		Cu.-N.	NE	d a. p.
4.	60.09	24.7	28.4	22.7	88.8	20.6	NW quad.	108.5	8.2	A.-Cu., Ci.-S.		Cu.-N.	NE, E	d a. p.
5.	60.52	26	30.5	21.6	77.8	19.2	Variable	116.9	6.2	A.-Cu.	SE	Cu.-N.	NE	d a. p.
6.	60.83	25.4	28.9	22	82.3	19.7	Variable	100.9	7	A.-Cu.	SE	Cu.-N.	E	d a. p.
7.	60.75	27.3	32.2	21.8	64.5	17.4	NE	212	1.8	Ci.		S.-Cu.	E	
8.	60.52	25.4	31.8	19.4	71.2	16.8	Variable	183.9	4.3	Variable		Cu.-N.	E	D a.
9.	60.68	25.5	31.7	19.4	72.7	17.3	Variable	151.7	2	Ci.		Cu.-N.	E	D a.
10.	61.03	24.4	29.8	20.4	84.2	18.9	Variable	99	4.8	Ci.-S.		Cu.-N.	E	
11.	61.36	25	30.6	18.8	76.7	17.9	Variable	133.4	4.3	A.-Cu.		Cu.-N.	E, ENE	D a.
12.	61.72	25.3	28.9	21.3	79.5	18.9	N, W	136.4	5.8	A.-Cu.	ESE	Cu.-N.	E, ENE	a. p. D p.
13.	61.85	24.9	27.4	22.8	80.8	19	NE, N	144.4	8.7	A.-Cu.		Cu.-N.	E, NE	p a. d p.
14.	62.75	26.1	31	22.5	73.5	18.4	Variable	153.7	8	A.-Cu.	ESE	Cu.-N.	NE	D a. p.
15.	63.08	26.3	31.8	21.2	69.2	17.3	ENE	189.5	4.2	A.-Cu.	ESE	Cu.-N.		D a. p.
16.	63.28	25.3	31.8	19.7	75.8	17.7	Variable	178.8	4.5	Ci.		S.-Cu., Cu.-N.	ENE	D a. p.
17.	61.75	26.3	31.1	20.8	65	16	NE	184	6.7	Ci.		Cu.	E	a. p. D p.
18.	60.62	26.9	32	20.6	61	15.8	NE	189.8	7.2	Ci.		Cu.	E, ENE	a. p. D p.
19.	59.80	25	32	20.9	79.8	18.5	N, ESE	122.8	8	Ci.	SE	Cu.-N.	E, NE	a. p. D p.
20.	58.83	26.2	29.8	22.8	80	19.9	NE quad.	170.9	9.7	Ci.	SE	Cu.-N.	ENE	a. p. D p.
21.	59.44	24.7	29.7	21.5	86.5	19.9	N, SW	126.8	8.2	A.-Cu.		Cu.-N.	E	p a. d a. p.
22.	58.80	25.8	31.1	21.2	78.8	19.1	Variable	143.4	6	A.-Cu.		Cu.-N., Cu. E, ENE		p a. D p.
23.	58.72	25.5	31.4	19.7	78.5	18.9	NW, E	157.1	4.3	A.-Cu.	ESE	Cu.	E	a. p.
24.	58.84	25.5	29.9	22.6	82	19.9	Variable	143.8	8.5	Ci.	SE	Cu.-N.	E	a. p. a. p.
25.	59.70	26.1	32.2	20.6	75.8	18.7	NE, E	168.2	5.2	Ci.		Cu.	E	D a. p.
26.	59.10	25.3	30.5	19.4	77	18.1	NE	158.3	2.3	Ci.-S.		Cu.	NE	D a.
27.	58.93	24.8	30.1	21.9	87.8	20.4	Variable	104.9	9	Ci.-S.		Cu.-N.	NE	10.2
28.	59.18	25.2	30.8	22.8	86.3	20.4	NE quad.	143.7	9.2	Ci.-S.		Cu.-N.	NE	8.1
Mean	760.60	25.6	30.4	21.3	77.3	18.6		153.7	6.3					
Total								4,304.5					70.9	

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 2.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	762.97	25	27.8	21.8	76.3	18	N, NNE	1.3	7.2	Ci.-S.	Cu., Cu.-N.	NE	
2.	62.12	24.3	27.5	21.8	86.5	19.5	N	.7	7.7	Ci.-S.	Cu.-N.	NE	13.6
3.	60.89	24.6	27.5	22	87.7	20.1	N	.8	9.8	-----	N.	NE	26.1
4.	60.37	24.4	26.8	22.6	88.8	20.1	N	.8	9	-----	N.	ENE	16.6
5.	60.70	25.8	30.5	22	83.8	20.6	N	.5	6	Ci.-S.	W	ENE	
6.	61.07	25.4	29	23.2	86.3	20.9	WNW	.5	6.8	Ci.-S.	Cu.-N.	ENE	12.4
7.	61.19	26.3	31.5	22	74	18.6	Variable	.3	1.8	-----	Cu.	NE	● a. p.
8.	60.90	26	31	22	77.5	19.2	SE	.3	3.3	-----	Cu.	NE	Ω <sup>2</sup> a. p.
9.	61.13	26	30.9	22.2	78.5	19.4	Variable	.7	2.3	Ci.-S.	Cu.	NE	Ω <sup>2</sup> a. p.
10.	61.09	25.7	30.8	22.5	82.2	20	WNW	.7	5.5	Ci.-S.	SW	Cu.	ENE
11.	61.50	25.6	30.5	21.7	80	19.4	Variable	.3	4.3	Ci.-S.	SW	Cu.	ENE
12.	62.18	24.1	29.4	22.8	89.5	19.9	Variable	1	8	Ci.-S.	Cu.-N.	ENE	1.5
13.	62.43	23	24.4	21.9	95.7	20	N	1	9.2	-----	N.	NE	23.1
14.	63.34	25.7	31	22.2	78.8	19.1	Variable	.5	6.5	Ci.	Cu.-N.	NE	104.9
15.	63.22	25.6	31.3	22.2	77.8	18.6	NW quad.	.5	4.5	Ci.-S.	SSW	Cu.	NE
16.	63.44	25.8	31.9	22	77.2	18.8	Variable	.5	5.8	Ci.-S.	SSW	Cu.	NE
17.	62.15	26.4	30.6	23.3	72.2	18.1	N, NE	1	6.5	Ci.	W, WSW	Cu.	NE
18.	61.04	26	32	22	71.7	17.5	NE	.7	4.8	Ci.	Cu.	NE	1.3
19.	60.10	25.7	29.4	22.8	81.2	19.8	NE	.7	8.2	Ci.-S.	SW	Cu.-N.	ENE
20.	59.38	25.8	28.5	23.4	85.2	21	SE	.7	9.2	-----	Cu.-N.	ESE	7.4
21.	59.66	24.9	27.5	22.5	89.3	20.9	Variable	.3	7.3	-----	Cu.-N., N.	NE	2.6
22.	59.19	26.7	30.9	23	78.5	20.2	SE quad.	.7	6	Ci.	Cu.-N.	ENE, E	37.8
23.	59.15	26.7	31	22.7	75.2	19.2	Variable	.7	4.2	Ci.-S.	Cu.	NE	2
24.	59.46	25.4	28.6	22	85.7	20.7	E	.7	8.2	-----	Cu.-N.	ENE	7.9
25.	60.24	26.4	31.3	22.8	81.5	20.7	SE	.2	4	Ci.-Cu.	Cu.	NE	● a. p.
26.	59.52	26.2	31.6	22.1	79.8	20	Variable	.5	3.3	Ci.-Cu., Ci.-S.	Cu.	NE	Ω <sup>2</sup> a.
27.	59.33	24.9	28	23.1	87	20.4	N	1	8.2	-----	Cu.-N.	NE	15.7
28.	59.56	25.1	28.7	22.5	86.8	20.5	NW, N	.3	8.8	Ci.-S.	N.	NE	43
Mean	760.98	25.5	29.6	22.4	82	19.7	-----	.6	6.3	-----	-----	-----	-----
Total	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	317.2

## Meteorological data for first and second class stations—Continued.

## CAPIZ.

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied, -1.81 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	763.48	25.4	29.9	23.5	78.5	18.9	NE	---	5.8	Ci.-S., Ci.	Cu. NE	d° p.
2.	62.74	25.9	30.2	23.8	74.8	18.7	NE	---	7.2	Ci.-S.	Fr.-N., N. NE	• a. d° p.
3.	61.32	25.8	29.3	24.2	78.8	19.5	NE	---	9.2	Ci.-S.	N. NE	• a. d° p.
4.	60.64	25.3	30	23.4	83.2	19.8	NE	---	9.7	Ci.-S.	N. NE	• a. d° p.
5.	60.80	26.2	30.3	23.6	83.8	21.2	NE	---	8.7	Ci.-S.	Cu. NE	• a. d° p.
6.	60.96	25.7	30.3	24	88.8	21.7	NE	225.4	7.2	Ci.-S.	Fr.-N. NE	• a. d° p.
7.	61.10	25.8	30.6	23.7	83.7	20.5	NE	199.9	5	Ci.-S.	Cu. NE	• a. d° p.
8.	60.72	25.6	30.4	22	81	19.6	NE, ENE	157.8	4.2	Ci.-S.	Cu. NE, E	• a. d° p.
9.	60.90	25.3	30.8	22.2	81.3	19.3	E	143.8	3	Ci.-S.	Cu. ENE, NE	• a. d° p.
10.	61.21	25.6	31.4	21.9	81.5	19.8	NE	120.5	3.5	Ci.-S.	Cu. E	• a. d° p.
11.	61.38	26.7	31.4	25.2	80.5	20.8	NE	202.9	7	Ci.-S.	N. NE	• a. d° p.
12.	61.91	24.8	28.5	23.4	86.3	20	NE	325.9	8.2	Ci.-S.	N. NE	• a. d° p.
13.	62.08	24.2	27	23.1	89.3	20	NE	---	9.1	Ci.-S.	N., Cu.-N. ENE	• a. d° p.
14.	63.31	24.8	29	22.5	84.2	19.6	NE quad.	210.3	8.7	Ci.-S.	Cu.-N. ESE	• a. d° p.
15.	63.32	25.4	29.8	23	79.3	19	NE quad.	---	3.2	Ci.-S.	Cu.-N., Cu. E	• a. d° p.
16.	63.48	25.9	29.5	21.4	81.2	19	ENE	147.9	5.3	Ci.	Cu. E	• a. d° p.
17.	62.06	26.1	29.7	23.4	74.5	18.8	NE	279.2	0	Ci.	Cu.-N. ENE, E	• a. d° p.
18.	60.72	25.1	30.6	20.9	75	17.5	ENE	209.5	2.3	Ci.	Cu. E	• a. d° p.
19.	60.14	26.2	30	22.8	78	19.6	ENE	210.4	6.5	A.-Cu.	Cu. E	• a. d° p.
20.	59.13	26.1	30.2	24.3	84	21.1	N quad.	220.5	6.8	A.-Cu.	Cu.-N. ENE, E	• a. d° p.
21.	59.08	26.4	30.5	23.4	85.2	21.6	ENE	163.6	5.3	A.-Cu.	Cu.-N., Cu. E	• a. d° p.
22.	58.60	26.4	31.4	24.3	86.5	21.9	E, ENE	142.9	7.8	Ci.	Cu. E	• a. d° p.
23.	58.64	25.6	30.9	23	84.3	20.4	E, ESE	182	5.7	Ci.	Cu.-N. NNE, E	• a. d° p.
24.	59.09	25.6	30.4	22.8	86	20.9	NE quad.	194.9	5.3	A.-Cu.	Cu.-N. E	• a. d° p.
25.	59.74	26.1	30	23	87.5	21.3	E	171.4	4.5	Ci.	Cu. NE	• a. d° p.
26.	59.47	25.8	30.4	23	83.5	20.4	NE	125	3.5	Ci.	Cu. ENE	• a. d° p.
27.	59.24	25.6	31.3	21	80.8	19.4	NE	111.9	7.7	Ci., Ci.-S.	Variable NE	• a. d° p.
28.	59.40	25.9	31.3	24	86	21.2	NE	210	---	---	---	• a. d° p.
Mean	760.88	25.7	30.2	23.1	82.4	20.1	---	188.4	5.6	---	---	---
Total	---	---	---	---	---	---	---	---	---	---	---	---

## CALBAYOG.

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied, -1.80 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	763.12	24.7	29.7	20.7	86	19.7	NE	304.1	4	Ci.-S.	S.-Cu. NE	• a. d° p.
2.	62.10	24.6	29.7	21.8	86.2	19.6	NE	226.5	6.5	Ci.-S.	S.-Cu. NE	• a. d° p.
3.	60.89	25.1	29.5	22.8	85.5	20.1	NNE	214.6	6.7	Ci.-S.	S.-Cu. NE	• a. d° p.
4.	60.19	24.5	29.7	21.9	90.8	20.6	NNE	133.8	8.7	Ci.-S.	S.-Cu. NE	• a. d° p.
5.	60.61	25	30.4	22.8	90.2	21.1	Variable	136.3	8.7	Ci.-S.	S.-Cu. NE	• a. d° p.
6.	60.88	24.5	29	22	90.8	20.7	S, SW	116.4	6.7	Ci.-S.	S.-Cu. ENE	• a. d° p.
7.	60.96	25.2	32	20.3	81.3	18.9	N	167.1	1.2	Ci.	Cu. NE	• a. d° p.
8.	60.71	24.6	32	19.6	85.7	19.4	ENE	140.1	3.3	Ci.-S., Ci.	S.-Cu. ENE	• a. d° p.
9.	60.86	24.6	30.4	19.8	86.5	19.8	Variable	135.6	1.3	Ci.	S.-Cu. E	• a. d° p.
10.	60.98	24.4	28.4	20.9	90.2	20.4	Variable	122.3	5.8	A.-Cu.	S.-Cu. NE, E	• a. d° p.
11.	61.53	24.5	30.9	21.5	89.7	20.4	N quad.	123	6.2	Ci.-S.	S.-Cu. NE	• a. d° p.
12.	62.08	23	25.1	21.8	96.2	20	NE	132.1	9	Ci.-S.	S.-Cu., N. ENE	• a. d° p.
13.	62.21	23.2	25.3	22.1	95.2	20.2	NNE, NE	119.5	9.8	Ci.-S.	N. ENE	• a. d° p.
14.	63.11	25.3	30.9	22	84	19.9	NE	136.3	8.5	Ci.-S.	S.-Cu. ENE	• a. d° p.
15.	63.24	24.4	30.9	19.8	83.5	18.7	NE quad.	154.6	4.2	A.-Cu.	S.-Cu. ENE	• a. d° p.
16.	63.34	25.3	32.4	20	81.5	19.2	NE	169.8	3.8	Ci.-S.	Cu. NE	• a. d° p.
17.	62.06	25	30.7	20.8	84.2	19.6	NE	188.8	5.8	Ci.-S.	S.-Cu. NE	• a. d° p.
18.	61.02	24.1	32.1	18.7	79.5	17.2	NE	197.8	2.8	Ci.	S.-Cu. NE	• a. d° p.
19.	60.20	25.2	31.7	19.9	83.5	19.6	NNE	199.3	5.2	A.-Cu.	S.-Cu. ENE	• a. d° p.
20.	59.17	25.5	30.7	22.5	89.5	21.6	NNE	135.8	8.8	A.-Cu.	S.-Cu. NE	• a. d° p.
21.	59.39	25.9	32.6	21.5	85.3	21	NE quad.	138.2	6.2	Ci.-S., A.-Cu.	S.-Cu. ENE	• a. d° p.
22.	58.94	26	31.6	22.6	85.5	21.3	NNE	139.3	4.8	Variable	S.-Cu. NE	• a. d° p.
23.	58.92	25.4	32.9	21.1	82.5	19.6	ENE	143.4	8	---	Cu. E	• a. d° p.
24.	59.38	25.1	30.3	21.6	90	21.2	NE	148.2	9	Ci.-S.	S.-Cu. ENE	• a. d° p.
25.	59.98	26	32.4	22.2	83.2	20.4	NE	148.1	4	Ci.-S.	S.-Cu. ENE	• a. d° p.
26.	59.36	25	32.9	19.7	86	20.1	N	161.9	1.8	---	S.-Cu., Cu. E	• a. d° p.
27.	59.17	24.5	30.4	21.8	90.7	20.7	N	124.4	7.7	Ci.-S.	S.-Cu. NE	• a. d° p.
28.	59.28	25.3	32.4	21.8	89.7	21.4	NE quad.	165.3	7.5	Ci.-S.	S.-Cu. NE	• a. d° p.
Mean	760.85	24.9	30.6	21.2	86.9	20.1	---	158	5.7	---	---	---
Total	---	---	---	---	---	---	---	4,422.6	---	---	---	---

**LEGASPI.**

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

[illegible]

ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Pressure (mean). mm.	Temperature.			Relative humidity (mean). P. ct.	Vapor pressure (mean). mm.	Wind.		Amount (mean). 0-10.	Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours. Km.		Form and its direction.					
										Upper.		Lower.			
1.	765.07	24.2	26	22.3	79.2	17.7	NE	947.5	7.2	Ci.		S.-Cu.	NE	1.8	☉ d° a. ☼° p.
2.	64.04	24.5	25.8	22.4	76.8	17.6	NE	817.8	6.5	A.-Cu.	NE	S.-Cu.	NE	3.3	☉ d° a. p.
3.	62.47	25.2	28	23	79.8	19	NE	684.7	7.3	A.-Cu.	ENE	S.-Cu.	NE	.8	☉ d° a. p.
4.	61.56	25.8	28.9	23.9	77.2	19.1	NE quad.	474.4	3.5	A.-Cu.	NE	Cu.	NE		
5.	61.61	25.7	28.8	23.8	82.2	20.1	N, NE	469.9	5.7	Ci.		Cu., S.-Cu.	NE	4.1	☉ d p.
6.	62.26	24.1	26	22.7	88.2	19.8	NE, N	505.4	9.7	A.-Cu.	ENE	S.-Cu.	NE	4.9	☉ a. d° a. p.
7.	61.85	24.7	27.6	22.7	87.5	20.2	N	-----	7.3	A.-Cu.	NE	S.-Cu.	NE	6.6	☉ a.
8.	61.07	25.2	28.2	21.9	82	19.4	NE, NW	-----	5.7	A.-Cu.	NE	S.-Cu.	NE	-----	-----
9.	61.31	25.5	28.9	21.9	85	20.6	Variable	246	3.3	A.-Cu.	SE	Cu.	SE	-----	☉ ☉ ☉ a.
10.	61.54	25.2	27.4	22.8	85.2	20.3	N	254.6	6.3	Ci.		S.-Cu.	NE, N	.8	-----
11.	62.36	25	27.9	22.8	89.8	21.1	NE, N	810.5	9.3	A.-Cu., Ci.-S.		S.-Cu.	NE	9.4	d° a. ☉ a. p. ☼° p.
12.	63.46	24.6	26.9	22.5	81.3	18.7	NE	1,003.2	9.8	Ci.-S.		S.-Cu.	NE	3.4	☼° d° a. ☉ a. p.
13.	63.14	25.2	27.9	23	79.2	18.8	NE	601.4	9.3	A.-Cu.	SE	S.-Cu.	NE	-----	-----
14.	63.56	25.5	28.8	22.1	79.5	19.2	NE	259.9	5.5	A.-Cu.	NE	Cu.	NE	-----	☉ p.
15.	63.88	24.8	29.5	20.4	82.3	19	NE, N	270.1?	2.3	Ci.		Cu.	NE	-----	☉ p.
16.	64.16	25.2	30	21.1	80.5	19	NE	-----	2.8	A.-Cu.	NE	Cu.	NE	-----	☉ p.
17.	62.65	26.2	29.4	24.4	77.8	19.7	NE	535.3	4.3	A.-Cu.	NE, ENE	S.-Cu., Cu.	NE	1	☉ p.
18.	61.48	25.2	28.4	22.1	83.3	19.9	NE quad.	347.2?	9	A.-Cu.	NE	S.-Cu.	NE	-----	☉ a. d ☉ p.
19.	60.84	26.1	29.9	20.5	78.2	19.6	NE	399.7	3.8	Ci.		Cu.	NE	-----	☉ p.
20.	60.19	25.8	28.6	23.8	81.5	20.1	NE	506.9	9.3	A.-Cu.	E	N., S.-Cu.	NE	11.1	d° ☉ p.
21.	59.86	25.6	29.4	23.1	87.5	21.4	NE	-----	9.7	A.-Cu.	SE	S.-Cu.	NE	.3	d° a. p.
22.	59.39	25.8	28.4	22	86.2	21.2	N, NW	247.5	4.5	Ci.		S.-Cu., Cu. N.	NE	5.8	☉ ☉ ☉ a.
23.	59.19	26.3	29.5	22.9	83.7	21.1	Variable	-----	6.8	Variable		S.-Cu.	NE	-----	☉ a. ☼° p.
24.	59.80	25.8	29.8	22	81.2	19.9	Variable	-----	7.7	A.-Cu.	ENE, E	S.-Cu.	NE	-----	☉ a.
25.	60.58	26.3	29.9	23.6	82.2	20.8	NE	369.8	7.3	A.-Cu.	NE	S.-Cu.	NE	-----	d° a.
26.	59.89	26.2	29.2	23.4	78.2	19.6	NE, N	268.1	3.5	A.-Cu.	NE	Cu., S.-Cu.	NE	-----	☉ a.
27.	59.66	25.3	27.9	23.7	84	20.1	NE	366.6	6.7	A.-Cu.	NE	S.-Cu.	NE	8.1	d° a. ☉ a. p.
28.	60.10	25.4	26.6	23.3	85.8	20.7	N	496.3	8.8	A.-Cu.	NE	S.-Cu.	NE	2.8	☉ d° a.
Mean	761.68	25.4	28.3	22.6	82.4	19.8	-----	494.7	6.4	-----	-----	-----	-----	-----	-----

*Meteorological data for first and second class stations—Continued.*

PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied,  $-1.73$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Amount (mean).	Form and its direction.						
									Upper.	Lower.					
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	765.32	25.2	27.8	22	73.5	17.4	ENE	828	6.7	Ci.-S.	Cu.	NE	5.3	● a. ☼ p.	
2.	64.09	24.9	27	22.6	81.7	19.1	ENE	517.8	7.2	Ci., Ci.-S.	Cu.	NE	9.1	● a. p.	
3.	62.62	25.4	28.3	23	79	18.9	ENE	468.3	5.12	Ci.	Cu.	NE	2.5	● a.	
4.	61.70	25.9	28.6	23.1	77.7	19.3	ENE	297.7	5.5	Ci., Ci.-S.	Cu.	NE, ENE			
5.	61.98	25.8	29.3	23	83	20.4	E	223.8	7.12	Variable.	Cu.	ENE	42.3	● p.	
6.	62.44	23.7	25.3	22.5	92.7	20.1	ENE	184.3	10	Ci.-S.	Cu.	NE	30	● a. p.	
7.	62.02	25.3	29	22.5	84.2	20.1	E	225.1	5.8	Ci.	Cu.	E	1.3	● a. ☼ p.	
8.	61.26	24.8	29.8	20.6	85.3	19.6	NE	147.6	5.2	Ci.	Cu.	ENE, E	4.1	☼ a. ● p.	
9.	61.61	25.4	30.3	21.6	86.2	20.7	E	168.6	4.8	Ci.	Cu.	E		☼ a. p.	
10.	61.71	24.6	30	21.5	89.5	20.4	NE	97.1	2.8	Ci.	Cu.	NE, E	7.1	☼ a. p.	
11.	62.63	24.4	29	21.5	91.5	20.8	ENE	500.5	10	Ci.-S.	Cu., S.-Cu.	ENE	41.7	☼ a. p. ☼ p.	
12.	63.98	23.9	25.8	21.9	86.2	19	ENE, NE	762.7	10	Ci.-S.	Cu.	NE	4.1	☼ a. ● a. p.	
13.	63.52	25.1	28.8	22	81.7	19.3	NE	391	10	Ci.-S.	Cu., S.-Cu.	NE	3.6	● a. d p.	
14.	64.02	25.9	29.2	22.5	75.7	18.8	E	263.3	4.8	Ci.	Cu.	E			
15.	64.14	24.7	30	20.6	82.2	18.8	NE	138.7	3.7	Ci.	Cu.	E		☼ a. p.	
16.	64.48	25	30.1	20.7	81.3	19	NE	210.8	5.2	Ci.	Cu.	E		☼ a. p.	
17.	63.06	26	30.3	24	79	19.8	NE	385.4	6.7	Ci.	Cu.	NE	1	● ☼ p.	
18.	61.74	25.7	29	22.5	78.8	19	E	260.1	9.3	Ci.-S.	Cu.	E	1.8	d ● a.	
19.	61.26	26.2	30.7	22.6	75.5	18.9	E	240.7	4.5	Ci.	Cu.	E			
20.	60.51	25.7	29.3	22.6	82.5	20.2	E quad.	315.3	10	Ci.-S.	Cu., S.-Cu.	E, NE	35.7	● p.	
21.	60.27	26.1	29.8	23.3	88.7	22.1	E	199.3	6.3	Ci., Ci.-S.	Cu.	E		☼ p.	
22.	59.72	25.7	30.3	22.9	86.2	21	E	193.7	5.5	Ci., Ci.-S.	Cu.	E	.5	☼ a. ● ☼ p.	
23.	59.49	25	30.3	21.8	82.7	20.4	E	184.2	2.5	Ci.	Cu.	E	.5	☼ a. p. ● ☼ p.	
24.	60.32	25.9	30.5	22	81	19.8	NE	194.7	2.3	Ci.	Cu.	E	11.2	☼ a.	
25.	61.04	25.4	30.3	22.4	86	20.6	NE	167.2	5	Ci.	Cu.	E	2.5	● a.	
26.	60.16	25	30	20.6	86	20.2	ENE	116	2.8	Ci.	Cu.	E		☼ a.	
27.	59.97	24.6	28.8	21.5	87.8	20.2	E	215.8	8.7	Ci.-S.	Cu.	E	4.3	☼ a. p.	
28.	60.41	25.9	30.8	23	82.3	20.4	NE	263.9	5.5	Ci., Ci.-S.	Cu.	E	.8	d ☼ p.	
Mean	761.98	25.3	29.2	22.2	83.1	19.8		291.5	6.2						
Total								8, 161.6					209.4		

SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied,  $-1.69$  mm.]

Day.	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	Pressure (mean).	Mean.	Maximum.			Minimum.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	764.98	23.8	30	19.2	74.7	15.9	N, NE	3.2	3.5	Ci.		Cu.	NE	0 p.
2.	64.14	23.7	31	17.6	74.7	15.7	N, NE	3	2.8	A.-Cu.	ENE	Cu.	E	0 p.
3.	62.54	24	32.4	18.8	76.2	16.5	N, NE	2.7	3.5	A.-Cu.	NE	Cu.	E	0 p.
4.	61.48	24	32.1	17.2	76.2	16.3	N, ENE	3	2.2	Ci.		Cu.	ENE	0 p.
5.	61.60	24.2	32.6	17.4	74.2	16	N	2.8	2.2	Ci.	SSE	Cu.	ENE	0 p.
6.	61.98	25.1	32	20.5	74.7	17.4	NE	2.7	5.3	A.-Cu.	SE	Cu.	ENE	0 p.
7.	61.61	25.3	32.4	20.4	76	18.3	ENE	2.3	5	Ci., A.-Cu.	SE	Cu.	NE	0 p.
8.	61.17	24.8	32	20.4	79.3	18.3	NE	1.8	6.3	Ci., A.-Cu.	ESE	Cu., Cu.-N.	ENE	0.3 d a.
9.	61.30	25.9	32.8	20.4	76.2	18.6	E	1.8	5.2	A.-Cu.	SE	Cu.	E	0 p.
10.	61.49	26.2	33.2	20	75	19.2	N	2.2	5.5	Ci.	SSW	Cu.	E	0 p.
11.	62.24	26.2	32.7	20.6	75	18.6	NE, ESE	2.8	4.8	A.-Cu.	SE	Cu.	E	0 p.
12.	63.33	23.7	31.6	18.4	75	15.9	ESE	2.8	3.2	Ci.		Cu.	E	0 p.
13.	62.95	24.6	31.1	20.5	76	17.2	E	2.8	4.3	Ci.		Cu.	E	0 p.
14.	63.56	24.6	31.7	19	77.3	17.5	NE	2.3	4.5	A.-Cu.	ENE	Cu.	E	0 p.
15.	63.68	25.5	33.2	18.6	76	17.9	NE, N	2.2	4.2	Ci.	SE	Cu.	NE	0 p.
16.	63.84	25.8	32.8	20.4	74.2	17.8	NE	2	4.3	Ci.		Cu.	NE	0 p.
17.	62.56	24.7	32.5	18.2	73.3	16.4	N, E	3	2.5	Ci.		Cu.	ENE	0 p.
18.	61.44	24.7	32	18.4	76.3	17.3	N, E	2.7	3.2	A.-Cu.	ENE	Cu.	E	0 p.
19.	61.02	24.4	32	18	74.7	16.2	N	2.7	2.3	A.-Cu.		Cu.	E	0 p.
20.	60.38	24.3	32	17	75.7	16.7	E	2.5	6.2	Ci.	SSE	Cu.	E	0 p.
21.	59.95	26.5	32.2	21.4	73.7	18.6	N	2.7	6.8	A.-Cu.	ESE	Cu.	E	0 p.
22.	59.29	27.2	33.5	22	71.8	18.9	N, E	2.8	4.7	A.-Cu.		Cu.	ESE	0 p.
23.	59.01	26	34	19.4	73.5	17.8	E	2.3	1.7	Ci.		Cu.	E	0 p.
24.	59.88	25.3	33.2	18.2	75.3	17.5	N, E	2.8	2.5	A.-Cu.		Cu.	E	0 p.
25.	60.39	25.9	34.9	18.2	72	17.2	N, E	2.3	2	Ci.		Cu.	E	0 p.
26.	59.71	27	34.5	20.6	72.7	18.7	NW	1.8	5.8	A.-Cu.		Cu.	NW	0.3 d p.
27.	59.55	26.9	34	22.4	75	19.3	N, E	2.2	6	A.-Cu.		Cu.	NE	0 p.
28.	60.12	26.8	34	21.9	72	18.4	NW, NE	1.8	4.3	A.-Cu.		Cu.	NE, E	0 p.
Mean	761.61	25.3	32.6	19.5	75	17.5		2.5	4.1					
Total													.6	

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied,  $-1.67$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
	mm.	°C.	°C.	°C.	P. ct.			mm.	Prevailing direction.		Total movement in 24 hours.	0-10.			Form and its direction.	
															Upper.	Lower.
1.	764.05	24.8	31.3	18.1	71.8	16.5	SE quad.	199.1	1	Ci.		Cu.	mm.	Ω a.		
2.	63.23	24.6	32.2	20.3	70.8	16.1	S, NNW	260.8	3.2	Ci.	S	S.-Cu., Cu.		Ω a.		
3.	61.83	24.8	33.7	19.5	75.7	17.3	S, N	179.3	1	Ci.		Cu.		Ω a.		
4.	60.60	25.3	34.1	19.4	73.7	17.5	S, NNW	233.9	.7	Ci.		Cu.		Ω a.		
5.	60.86	25.5	31.4	19	78.5	18.4	SE, NW	226.5	2.2	Ci.		Cu.		Ω a.		
6.	61.30	25.4	32.4	20	81.5	19.5	S	164.4	4.5	A.-Cu.	SSE	S.-Cu.		Ω a.		
7.	60.86	26	33.4	21.2	79.5	19.7	SE, NNW	198.8	4.3	A.-Cu.	SSE, E	S.-Cu.		Ω a.		
8.	60.38	26	32.4	21.1	76	18.9	S quad.	177.6	4.8	A.-Cu.	ENE	S.-Cu.		Ω a.		
9.	60.67	26.4	33.6	22.5	77.2	19.5	Variable	206.7	4	A.-Cu.	SE	S.-Cu.	10.4	☾ ● p.		
10.	61.02	25.8	30.3	22	87.7	21.5	NW quad.	218.6	5.8	Ci.-S.		Fr.-N.	SW			
11.	61.26	26.6	34.4	22.8	81.5	20.9	Variable	205.7	4.7	Ci.		S.-Cu.				
12.	62.20	25.9	34	21.2	68.5	16.7	SSE	275.6	.7	Ci.		Cu.				
13.	62	25.9	33.4	21.6	71.8	17.6	S	241.2	2.7	A.-Cu.		S.-Cu.				
14.	62.61	26.4	34.3	20	74.2	18.7	S, SE	237.7	3.8	Ci.-S.		Cu.	2	Ω a. ●° p.		
15.	63.20	25.4	32.5	19.9	79.5	19.1	SE, NW	274.5	5.8	Ci.-S.	SW	Fr.-Cu.	NNW			
16.	63.14	26.4	34.8	22.1	78	19.8	Variable	221.3	2.8	Ci.		S.-Cu., Cu.		Ω a.		
17.	61.58	26.6	35.1	20.5	68.3	17.1	SSE	244.3	1.5	Ci.		S.-Cu.	ESE	Ω a.		
18.	60.50	26.2	34.1	20.4	69.8	17.4	SE quad.	190.9	3.2	Ci.		S.-cf.	ESE	Ω a.		
19.	60.24	26.2	35	19.5	73.7	18	SE	214	.2	Ci.		Cu.		Ω a.		
20.	59.57	25.4	31.4	19.3	77	18.3	Variable	173.9	4	Ci.		Cu.				
21.	58.84	27.2	35.3	21.5	74.2	19.4	S quad.	258.8	4.3	A.-Cu.		S.-Cu.		☾ ☉ d p.		
22.	58.42	28.3	36.3	23.1	73	20.4	S quad.	261.3	2.8	Ci., A.-Cu.		S.-Cu.		d p.		
23.	58.27	27	35.2	22.1	70.7	18.6	S, SE	239.4	.8	Ci.		Cu.				
24.	59.02	26.3	35.4	20.1	76.3	19.2	SE quad.	176.6	.7	Ci.		Cu.		Ω a.		
25.	59.77	26.7	33.2	21.4	78.2	20.1	SE, NNW	229.9	.3	Ci.		Cu.		Ω a. ∞° p.		
26.	59.24	26.6	32.2	22.6	80.7	20.7	Variable	266.3	3.7	Ci.		S.-Cu.	ENE	d a.		
27.	59	26	29.9	21.6	82.8	20.6	NW quad.	244.7	4	A.-Cu.	SSE	Cu.		Ω° ≡ a.		
28.	59.42	26.3	31.8	21.6	78.5	19.6	NW, SE	229	.5			Cu.		d2 a.		
Mean	760.82	26.1	33.3	20.9	76	18.8		223.2	2.8							
Total								6,250.8					12.4			

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied,  $-1.65$  mm.]

[illegible]

## Meteorological data for first and second class stations—Continued.

BAGUIO.<sup>a</sup>[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	640.38	15.9	22.8	11.1	73.3	9.7	E	478.2	4.3	Ci.		Cu.	WSW	≡ d° p.
2.	39.45	15.2	22.3	11	64.2	8	E, SE		5.7	Ci.-S.	S	Cu.		○ a.
3.	38.45	16.4	23.3	12.1	70.8	9.8	E	435.5	3.3	Ci.		Cu.	SE, SSE	
4.	37.69	16.3	22.7	12.2	75.5	10.4	SE quad.	322.2	4.3	Ci.		Cu.	WSW, SE	≡ p.
5.	37.95	16.7	22.3	12	79.8	11.3	Variable	315.1	5.3	Ci.		Cu.	SW	p. ∞ ∞ a. ≡ p.
6.	38.45	16.3	22.4	13.1	85.3	11.7	Variable	290.1	7.6	A.-Cu.	SE	Cu.	ESE	23.6 p. ∞ ∞ a. ≡ p.
7.	38.18	16.7	24.1	14.1	90.3	12.6	E, SE	392	8	Ci.	SSE	S.-Cu., Cu.		≡ d° p.
8.	37.77	16.8	21.3	14.1	87	12.4	E, WSW	269.5	7.6	A.-Cu.	S	Cu., Cu.-N. SE		p. ∞ ∞ a. ≡ p.
9.	37.98	17	21.8	14.3	84.2	12.2	SW quad.	250.1	7.7	A.-Cu.	S	Cu.	WSW	≡ p.
10.	38.24	17	21.4	14.8	90	12.9	SW	159.3	8.1	A.-Cu.	WSW	Cu., Cu.-N.	.5	p. a. ≡ d° p.
11.	38.63	17.1	24	13.1	81.5	11.8	E	409.7	6	Ci.-S.		Cu.	E, SE	≡ p.
12.	38.95	16	22.5	12.1	80	10.7	E	406.1	6.9	Ci.		Cu.	SSE	≡ p.
13.	38.98	16.4	22.6	12.7	82.2	11.3	E	337.8	4.6	Ci.		Cu.	S	≡ p.
14.	39.52	17.1	22.9	13.4	81.7	11.7	Variable	316	4.1	Ci.		Cu., Cu.-N.	S	p. ∞ ∞ a. ≡ p.
15.	40.09	17.3	24.2	13.8	87.2	12.7	WSW	169.5	7.6	Ci.-S.	S	Cu.		p. ∞ ∞ a. ≡ p.
16.	40.06	17.4	23.2	13.6	85.7	12.5	E, WSW	279.4	3.4	Ci.		Cu.		p. ∞ ∞ a. ≡ p.
17.	38.68	16.5	23.3	12.1	76.3	10.4	E, SE	362	2.6	Ci.		Cu.	SW, WSW	p. ∞ ∞ a. ≡ p.
18.	37.78	16.9	24	12.4	73.5	10.4	Variable	374.4	2.1	Ci.		Cu.	SE	∞ ∞ a.
19.	37.50	17.1	22.9	12.7	82	11.7	Variable	276.8	3.1	Ci.		Cu.	S	p. ∞ ∞ a. ≡ p.
20.	37.03	18.2	23.6	13	62.5	9.6	E quad.	343.6	7.6	Ci.	S	Cu.	SE	p. ∞ ∞ a. ≡ p.
21.	36.94	17.8	26.5	15.3	82	12.4	E	498.5	6.4	Ci.-Cu.	S	Cu., Cu.-N.		15.7 p. ∞ ∞ a. ≡ p.
22.	36.70	18.8	25.2	14.8	83	13.2	E	421.3	5	A.-Cu.	SSE	Cu., Cu.-N. SE		p. ∞ ∞ a. ≡ p.
23.	36.46	18	23.6	15.3	89.3	13.6	SW quad.	274.3	5.3			Cu.		p. ∞ ∞ a. ≡ p.
24.	36.86	17.7	22.5	14.3	86.3	13	SW, SE	333.3	6.7			Cu.	N quad.	p. ∞ ∞ a. ≡ p.
25.	37.62	18.1	23.9	14.7	80.7	12.5	E, SW	251	3.7	Ci.		Cu.	W	∞ ∞ a. ≡ p.
26.	36.94	16.9	23.3	14	88	12.6	Variable	231.2	6.7	Ci.		Cu.	Variable	p. ∞ ∞ a. ≡ p.
27.	36.51	16.8	23.7	14	90	12.8	Variable	234.4	6.9			Cu.-N.	Variable	≡ p.
28.	36.98	16.8	23	12.8	81	11.5	Variable	326	3.9	Ci.		Cu.	ENE, E	p. ∞ ∞ a. d° p.
Mean	638.10	17	23.2	13.3	81.2	11.6		324.3	5.5					
Total													40.3	

VIGAN.

[ $\phi=17^{\circ} 34' N$ ;  $\lambda=120^{\circ} 23' E$ ; barometer above sea, 14.7 meters; gravity correction not applied, -1.61 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.					mm.
1.	764.18	26.3	31.5	20	55.3	13.9	ENE	2.2	1	Ci.	S	Cu.		
2.	63.43	25.8	31.7	21.8	61.3	14.9	ENE	1.3	1.8	Ci.		S.-Cu.		
3.	61.93	25.2	31	18.8	69.5	16.4	NNW	.8	.2	Ci.	SSW	Cu.		
4.	60.89	25.4	30.8	21.2	72.3	17.3	Variable	1.2	.7	Ci.		Fr.-Cu.	NNW	
5.	61.34	25.3	30.3	21.4	80	19	Variable	1.2	2.7	Ci.		Cu.	NW	
6.	61.50	25.3	31.2	20.8	79.2	18.8	N quad.	1	2.3	Ci.		S.-Cu.		
7.	60.96	27.4	32.3	21.9	66.2	17.6	Variable	1.3	4.7	A.-Cu.	SW	Cu.	SE	
8.	60.38	26.8	31.4	22.3	76.8	20.1	WNW	.7	2.2	A.-Cu.		Cu.	NW	
9.	60.84	26.6	31	23.4	78.3	20.1	S quad.	1	5.2	A.-Cu.	SW	S.-Cu., Cu.	SW	
10.	61.27	25.4	29.2	21.8	84.2	20.1	N quad.	1.7	3.2	A.-Cu.	SSW	S.-Cu., Cu.		
11.	61.73	26.2	32.2	21.5	66.7	16.6	NNE	2.2	4	A.-Cu.		Fr.-Cu.,	NE, SE	
12.	62.29	26.5	31.2	23.7	60.8	15.6	ENE	1.7	3.8	A.-Cu.	SSW	S.-Cu.		
13.	62.19	26.2	31.5	22.2	70.7	17.8	N quad.	1	2	A.-Cu.		Fr.-Cu.	W	
14.	62.80	26	30.8	22	76.7	19.1	Variable	.7	.8	Ci.-S.		Cu.		
15.	63.57	25.6	31.5	22.3	81.5	19.7	N	1.5	3.5	Ci.	SSW	Cu.	N	
16.	63.31	26.1	31.7	20.3	72.2	18	N quad.	1	.2	Ci.		Cu.		
17.	61.76	26	31	22	71.7	18	WNW	.8	.5	A.-Cu.		Fr.-Cu.	NW	
18.	60.70	26.2	32	22.5	74	18.6	Variable	1.2	1.8	A.-Cu.	NNE	S.-Cu., Fr.-Cu.	NE	
19.	60.52	26.4	31.5	22.1	79.5	20.1	N	.8	3.5	A.-Cu.		Cu.	NW	
20.	59.98	25.2	32	21.2	82.7	19.6	N quad.	1	6	Ci., Ci.-S.	SW	S.-Cu.		
21.	59.10	26.4	31.2	22	78.3	19.8	ESE	.8	5.7	Ci.-S.	SW	Cu.	NNW	d° p.
22.	58.66	27.2	32.6	23.7	80.3	21.4	Variable	1.3	1.3	A.-Cu.	SW	Cu.		≡ p.
23.	58.34	26.8	31.1	23	82.7	21.5	SSW	1	2.2	A.-Cu.	SW	Cu.		≡ p.
24.	59.15	27	31.8	23.7	81	21.2	Variable	.7	4	A.-Cu.		Cu.	SW, NW	
25.	59.93	26.5	32.2	23.4	74.3	19	N quad.	1	2.3	A.-Cu.		Cu.	NNE, WNW	
26.	59.58	25.2	30.5	21.2	77.2	18	NNE	2	2.2	A.-Cu.		S.-Cu.	NNE	
27.	59.35	24.6	30.2	20.9	70.3	15.9	NNE	2	1.5	Ci.-S.	SW	S.-Cu., Cu.		
28.	60.06	24.4	32.3	19.8	70.5	15.8	NNE	1.7	.2	Ci.		S.-Cu.		
Mean	761.06	26	31.3	21.8	74.1	18.4		1.2	2.5					
Total														0

<sup>a</sup> The barometric readings of this station are not reduced to sea level.



**TUGUEGARAO.**

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).			Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.	Force (mean).			Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.		
1.	767.28	21.4	26.2	18	82.5	15.6	NE	0.7	7.8			S.-Cu.	NE		
2.	66.06	22.2	28.5	18.4	80.5	15.3	Variable	.5	7.3	Ci.		S.-Cu.	SE	Ω <sup>2</sup> a.	
3.	64.11	22.1	28.7	18.2	85.3	16.6	WNW, NE	.3	7			S.-Cu.	NE	Ω <sup>2</sup> a.	
4.	62.24	23.5	32	19.1	83.5	17.8	SE	.5	4.5			Cu.	SE	Ω <sup>2</sup> a.	
5.	62.14	24.5	32.7	18.2	79.3	17.3	SE, S	.8	3.7	Ci.		Variable	SE, S	Ω <sup>2</sup> ≡ <sup>2</sup> a.	
6.	63.06	23.8	29.4	18.2	81.7	17.8	N quad.	1.2	5.5	Ci.		Cu.-N.	N	Ω <sup>2</sup> ≡ <sup>2</sup> a.	
7.	63.67	22.6	25.6	20.5	86.3	17.6	NW, N	2.2	9.3			Cu.-N.	N, NE	2.3 Ω <sup>2</sup> a. p p.	
8.	62.31	23.1	29	19.9	88.3	18.3	NE	.5	7.7	A.-S.		Cu.-N.	NE, N	1.3 Ω <sup>2</sup> a. p p.	
9.	61.56	24.1	32.2	18.9	85.3	18.6	SE, NW	.3	4.3			Cu.	SE	3.3 Ω <sup>2</sup> a. p [ 3/4 ] 4° 4° p.	
10.	62.06	24.1	29	21.7	87	19.4	N	1.7	8.5			Cu.-N.	N	d° a.	
11.	64.72	22.7	27.4	19.4	85.8	17.4	N quad.	3.7	9			Cu.-N.	N		
12.	65.49	21.4	26.1	18.2	82.5	15.6	N quad.	1.2	9			S.-Cu.	NE		
13.	63.98	23	31	17.5	82.7	17.1	Variable	.7	4.5	Ci.		Cu.	SW	Ω <sup>2</sup> ≡ <sup>2</sup> a.	
14.	63.63	24.3	33.2	17	82.5	18.6	Variable	.5	2.3			S.-Cu., Cu.	S	Ω <sup>2</sup> ≡ <sup>2</sup> a.	
15.	64.19	24.6	31.8	19.4	79.8	18.2	S, N	1	6.2	Ci.		Cu.		Ω <sup>2</sup> a.	
16.	64.54	24.2	30.6	19.4	80.2	17.4	NW	1	1.8	Ci.		Fr.-Cu.	N	Ω <sup>2</sup> a. ∪ <sup>2</sup> p.	
17.	63.76	22.9	28.5	18.8	84.5	17.4	NE	.3	5.2			Cu.-N.	N		
18.	61.92	24.4	33.4	19	76.3	16.9	SSE, SE	.3	2.8	Ci.-S.		Cu.	S	Ω <sup>2</sup> a.	
19.	61.36	24.2	33	16.6	76.3	16.6	S	.3	0					Ω <sup>2</sup> a.	
20.	60.88	24.2	33.1	17	77.3	16.8	SE	.3	4.3	Ci.-S.		Cu.		Ω <sup>2</sup> a. ∪ <sup>2</sup> ∅ <sup>2</sup> p.	
21.	60.22	26.2	34.1	21.1	78.8	19.6	Variable	.8	5.7	Ci.		S.-Cu.	SW		
22.	59.38	27	34.9	21.8	78	20.2	SE	.8	6.5			Cu.-N.	NE	9.1 ● [ 3/4 ] 4° p.	
23.	59.04	25.8?	33.7	22.1	84.8?	20.6?	SE	.5	2.2			Variable		Ω <sup>2</sup> a.	
24.	60.05	24.8	32.7	18.8	77.3	17.4	Variable	.7	1.7			Cu.	SE, N	Ω <sup>2</sup> a.	
25.	60.68	25.9	34	21.6	81.3	19.8	Variable	.8	5.7			Cu.-N.	N		
26.	60.48	24.5	29	22.3	85.2	19.4	NW, N	1.5	9.3			Cu.-N.	N, NW	d° a. p.	
27.	60.65	24	29.4	20.7	81.3	17.9	N quad.	1.7	6.5			S.-Cu.	SE		
28.	61.46	24	30.6	18.6	77.2	16.8	NW	1.2	8			S.-Cu.	NW	Ω <sup>2</sup> a.	
Mean	762.53	23.9	30.7	19.3	81.8	17.8		.9	5.6						
Total														16	

**APARRI.**

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.	
1.	767.64	21.6	25.4	18	79.8	15.3	E	241.9	6.3	A.-Cu.	SW	S.-Cu.	E		
2.	65.86	22	26	18	81	15.9	E	177	6	S.-Cu.	SE quad.				
3.	64.08	22.4	26.5	19.1	81	16.2	SE, E	158.2	5.5	S.-Cu.		SE			
4.	62.06	23.3	28.5	19.6	83.8	17.8	S, E	239.4	.3	S.-Cu.					
5.	62	23.7	29.3	19.7	79.8	17.2	E quad.	265.9	0						
6.	63.41	23.6	28.5	20	81.8	17.7	NE	346	6.3	A.-Cu.	E	S.-Cu., Cu.-N. NE		0.8	☉ a. p.
7.	64.09	22.2	24.1	21	82.3	16.4	E	414.2	10	S.-Cu., Cu.-N. E				3.4	☉ a. p.
8.	62.45	23.3	25.8	20.7	85.2	18.1	E	343.7	8.2	A.-Cu.	E	Cu.-N. E			☉ a. p.
9.	61.48	23.8	29.4	18.3	84.3	18.4	NE	237.1	3			S.-Cu.	SW	26	☉ a. p.
10.	62.42	24	26.4	21.5	85.7	18.9	NE	347.6	9.7			S.-Cu., Cu.-N. NE		6.9	☉ a. p.
11.	65.84	21.1	23.7	18.7	85.7	16	NE	679.8	10			S.-Cu., N. NE		18.9	☉ a. p.
12.	65.80	21	23.7	18.4	82.2	15.2	E	374.2	10			S.-Cu. E, ENE		.8	☉ a. p.
13.	63.95	22.4	26.5	19.4	82.7	16.6	E	206.3	4.7	A.-Cu.	SW	Cu.	SE		
14.	63.35	23.8	29.5	19.5	81.5	17.8	S	284.5	2.8	A.-Cu.		S.-Cu.	SW		
15.	64.15	24.7	29.5	20.6	79	18.1	Variable	285.1	5.8	Ci.	S	S.-Cu.	N		☉ a. p.
16.	64.98	24.2	28.6	20	78.5	17.5	N	299.8	3.5	Ci., S.-Cu.		Cu.-N.	NE	1	☉ a. p.
17.	63.70	23	25.5	21.2	86.7	18	E	234.6	10	A.-Cu.	S	Cu.-N.	E	.3	☉ a. p.
18.	61.81	24	29	20.2	80.5	17.7	E quad.	200.9	1.7	A.-Cu.		S.-Cu.			☉ a. p.
19.	61.03	24.7	30.7	20.6	74	16.8	SSE, E	306	1.7	A.-Cu.		S.-Cu.			☉ a. p.
20.	60.62	24.4	29	20.5	79	17.8	S	214.4	6.7	Ci.	SW	Cu., S.-Cu.			☉ a. p.
21.	59.85	24.7	30	19.6	82	18.9	Variable	197.8	7.3	A.-Cu.	SSW, W	S.-Cu.	W		☉ a. p.
22.	59.16	26.1	32.7	22.5	76.3	19	S	364.7	6.7	A.-Cu.	SW	S.-Cu.	S		☉ a. p.
23.	58.78	25.2	30.5	22.4	83	19.7	Variable	260.5	1.3	Ci.-S.		Cu.	S		☉ a. p.
24.	60.26	24.9	29.5	22	83.5	19.5	NE quad.	348.5	3.2	A.-Cu.	E, NW	Cu.-N.	NE		
25.	61.04	25	28.5	23	83.7	19.7	ENE	371.1	6	A.-Cu.	SE, W	S.-Cu.	E		
26.	60.95	24.9	28.5	23.5	75.8	17.7	NE	361.2	8.8	A.-Cu.	SW	S.-Cu.	NE		
27.	61.29	24.4	28	22.1	72	16.3	NE	416.4	8			S.-Cu.	NE	4.1	☉ a. p.
28.	61.81	23	26.5	20.8	83.8	17.4	Variable	271.9	10			Cu.-N.	ENE	2.4	☉ a. p.
Mean	762.64	23.6	27.8	20.4	81.2	17.6		301.7	5.8						
Total								8,448.7						64.6	

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, FEBRUARY, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan	4.1											0.3				
Zamboanga																
Davao		6.9													24.9	
Cotabato	1.3	5.3			7.4	3.3									.3	
Cagayan, Misamis		2.3											7.6	3.3		
Dapitan	17.5	9.1	10.7	5.6		14.5		1.5	1.8	4.1			5.8	7.6		
Butuan	24.6	7.4	2.3	11	20.8	15	0.3		3.6	4.1			50	5.1		
Dumaguete	.4	20.8	21.8			2							7.9	6.7		
Yap, W. Carolines				2.5								.3	6.9	18.8	18.3	29.8
Maasin	18.8	67.1	28.9													
San José Buenavista													1.8			
Cuyo													1.3			
Borongan		37.3	12.9	41.9	12.4	.5	5.8	1	4.1	5.3	6.1	91.7	110.5		.5	3
Masbate				1.3	1.5	19.3				5.1	14	36.3	4.6	.8		
Romblon	12.4			.3	4.6	1.3	5.1				19.8	11.2	.5			
Laoang	4.8	3.8	4	48.7	32.5	2.8	.8	.3	.5	3.8	20.3	112.5	23.6	.8	.5	.3
Sumay, Guam		2.5	5.1							6.4		1.3	6.3	3.8		5
Calapan	4.1	4.1	1.6		.5	2	4.1	.3			6.6	6.1	5.6	8.4		
Virac	.3			.5	34.8	10.2		1.8		1	10.7	1.1	.2			
Nueva Caceres					4	2		6.6			.5					
Batangas	2										.5					
Silang					2.3		9.4									
Santa Cruz, Laguna	.8	.3			1.3		.8				1	.3				
Antipolo																
Iba										10.2						
Tarlac																
Baler	.1	11.4	2.3		.5	.8	.2	1.3	.3	9.7	1.3	6.9	35.8	1.5		
San Fernando, Union									.3							
Echague							1	2.3		3.3						
Candon																
Laoag																
Santo Domingo, Batanes	2.6				.4	12.4	.4	1.3	16.2	13.5	.6					

Station.	Day of month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Isabela, Basilan				99.6	15.2			1.3	19.4			4				153.4	
Zamboanga										0.8		24.4				31.3	
Davao			8.9									10.7				10.7	
Cotabato			29.2		11.9		.3		27.7		0.8					40.7	
Cagayan, Misamis			12.5				1.5									87.5	
Dapitan			11.5	4.6	15.7	2.5	8.9									27.2	
Butuan		4.8	25.4	14.3	10.9		3.6	.8			.3					121.4	
Dumaguete			5.4													204.3	
Yap, W. Carolines			.5	1.5	1	.3			3.3			1				65	
Maasin			22.1													84.2	
San José Buenavista																136.9	
Cuyo																1.8	
Borongan		2.5	9.1	11.4	25.4	7.6	7.4	62.2		6.1	5.5	67.8				1.3	
Masbate				31				7.6								538	
Romblon				21.8					.5							121.5	
Laoang			2.3	.3	.5	1	.5	1.3	.3	3						77.5	
Sumay, Guam	3.8					1.3										269.2	
Calapan	.5	.3			15.2	1.5	1.3	6.4	4.3		.5	13				36.8	
Virac	.8	2	.3	32.3	.1	3.3		.8								85.1	
Nueva Caceres				2.6		1										100.2	
Batangas	.8										1.3					16.7	
Silang	3.3	1.5						1								4.6	
Santa Cruz, Laguna	.8	.5		10.9	.8	.8	.8				2.6	2.6				17.5	
Antipolo																24.3	
Iba											.8					.8	
Tarlac																10.2	
Baler		9.4	4.8	2.5	4.6	2.3		8.6		1.5						0	
San Fernando, Union					.3											105.8	
Echague																.6	
Candon																6.6	
Laoag																0	
Santo Domingo, Batanes			.1				55.1	54.1	.2		1.8					0	
																158.7	

## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, FEBRUARY, 1913.

Date.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Dapitan.		Butuan.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	31.8	21.3	34.1	22.1	32.2	22.4	31.3	22.1	33	23	29.9	22	27.2	23.8	25.6	22.4
2	30.8	23.6	34.2	22.1	31.2	22.2	32	22.1	32.5	22.6	28.4	23.5	30	22.8	25.3	22.7
3	28.9	24.3	33.1	23.1	30.1	23.6	32.7	20.4	33.3	20.5	30	21.9	30.1	23.7	29.5	21.7
4	30.4	23.3	34.1	22.1	32	22	28.8	20	32.7	21	29.4	21.3	30.7	23.4	28.3	22.1
5	30.2	22.4	31.1	22.7	29.1	23.3	31.8	21	34.3	21.8	30.1	22	30.6	23.7	28.5	22.2
6	30.4	21.9	31.8	22.1	30.4	23.4	33.7	20.5	34.6	21.7	30	20.7	31.9	24.3	29.1	21.4
7	31.8	21.5	34.1	22	31.4	22	31.7	21.8	34	22.6	31.5	22.5	29.6	24.2	28.2	22.2
8	32.7	21.5	34.3	21.7	30.5	21.9	31.6	20.3	33.5	20.1	31.2	18.8	30.1	23.6	29.3	19.9
9	30.8	21.9	34.1	21.1	31.5	22	31.8	20	34.9	21.2	30.6	20	30.6	24.1	27.5	20.2
10	31	21.8	31.1	21.7	29.6	23.1	32.1	19.5	35.9	21.4	30.5	20.8	30.1	24.6	27	21.2
11	30.9	21	34.8	20.7	32	22.1	32.9	20.8	36.5	22	30	21.4	30.9	23.3	28.6	19.6
12	31	21.4	34.3	20.9	32	22.2	32.2	19.6	36.2	21.9	30.6	20.1	31.4	24.6	28.2	20.8
13	31.8	22	33.8	20.3	30.7	22	33.2	19.9	35.3	20.9	32	19.9	31.5	24.5	29.1	21.5
14	30.5	21.4	34	20.5	31.1	22	27.2	20.9	31.6	20.9	25.7	21.4	29.3	23.1	25.5	22.7
15	30	21.8	34.4	21.1	32.9	22.6	31.7	20	34.2	21.2	30	20.9	31.2	23.9	28.5	21.4
16	30.9	23.1	34.1	20.3	32.1	21	29.6	21.4	33.5	20.6	30	20.1	30.5	22.2	27.3	20.1
17	30.6	19.9	35.1	20.7	31.6	22	31.8	21	35.7	20.7	30.4	19	31.8	24.2	28.1	20.6
18	31.7	19.4	34.6	20.5	32.5	21	32.6	20.5	35.2	20.9	31	19.5	31.1	23.9	28.8	20.5
19	31	21.5	34.6	20.6	32.1	22.2	31.9	22	33.7	23	30.5	22.3	28.9	23.4	26.5	22.6
20	30.4	23.5	34.9	21.2	32.4	23.2	32.2	21.3	34.3	21.9	30.8	22.8	30.6	24.2	28.1	23
21	29.1	22.2	34.3	22.1	33.4	22.9	32.7	21.4	35.7	21.7	30.5	21.4	31.5	24.5	27.7	23.2
22	31.3	21.4	32.1	21.1	30	22.9	32.7	20.5	34.7	21.8	30.6	21.3	30.6	24.3	29	22.3
23	30.9	21.1	31.6	22.1	29.5	23.4	32.1	21.2	33.6	21.3	30.5	20.1	31.6	24.5	27.5	21.8
24	31	21.2	34.1	21.6	33	22.9	31.7	20.2	36.1	22	30.5	21.4	31.1	25	29.5	22.2
25	28.9	23.3	32.2	22.1	30.6	23	32.3	21.8	36.2	21.9	30.1	22	31.8	24.7	30.1	23
26	30.4	22.2	31.3	21.4	30.5	23	34.2	20	34.6	22	31	22	31.6	24.2	28.5	21.6
27	31	21.5	33.2	21.1	29.5	21.9	34.5	21	34.7	22.6	30	20.6	32.8	22.1	25.7	22.6
28	29.8	21.3	28.3	20.6	29.6	23.3	30.3	19	34.9	22.6	32.2	20.1	31.7	24.6	30.1	22.8
Mean	30.7	21.9	33.3	21.4	31.2	22.5	31.9	20.7	34.5	21.6	30.3	21.1	30.7	23.9	28	21.7

Date.	Dumaguete.		Yap, W. Carolines.		Maasin.		San José Buenavista.		Cuyo.		Borongan.		Masbate.		Romblon.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	27	22.6	30.3	22.8	28.5	21.2	21.1	29.2	24.5	28.6	23.5	22.8	30.3	21.1	21.1	21.1
2	29.5	21.6	29.8	22.9	28.8	22.5	20.9	28.7	24.2	28.5	22.2	24.6?	32.1	22.8	32.1	22.8
3	28.3	22.6	30.5	24	28.9	22.6	23.2	29.1	24.6	28.4	22.5	24.8?	32.7	23.1	32.7	23.1
4	28.7	22.1	31.5	23.9	28.9	22.2	22	28.9	24.8	26.5	22.1	24.8	31.6	23.4	31.6	23.4
5	29.7	23.8	30.6	23.5	29	22.2	23	29.8	24.7	29.7	21.6	24	32.1	23.5	32.1	23.5
6	29.8	23.3	31	24	29.2	22.5	21.4	29.5	25.1	29.8	22.3	24	30.2	23.4	30.2	23.4
7	28.3	23.5	30.7	24.3	30.5	22.6	22.5	31.2	25	29.6	20.8	23.5	31.7	22.6	31.7	22.6
8	28.8	21.6	29.7	23	30.5	21.4	19	31	24.6	29.9	20.7	22.5	33	22.2	33	22.2
9	29.7	23	30.8	22.5	30.6	21.4	19.4	31.3	24.8	29.6	20.1	22.5	32.7	22.6	32.7	22.6
10	29.9	22.8	31	24.1	30.6	21.5	20.3	31	24.9	30.1	21.5	22.2	33.1	21.7	33.1	21.7
11	28.7	22.9	31.2	24.2	30.5	20.8	20.4	30	25.1	30	19.4	24.5	32.8	20.8	32.8	20.8
12	29.2	21.4	31.3	22.6	30.6	20.8	21.5	29	24.6	30.1	21.7	21.5	28.3	22.2	28.3	22.2
13	29.2	23.5	31.2	22.4	30.8	22.4	22	28.7	24.5	26.1	21.1	22.6	32.6	21.9	32.6	21.9
14	28.3	22.5	29.9	23	30.7	22.4	21	29.5	23.7	29.2	21.6	23	32.6	23.5	32.6	23.5
15	28	23.8	28.4	21.9	30.6	22.5	19.5	30.2	24.2	29.3	20.6	23.8	32.7	23.3	32.7	23.3
16	29.6	20.8	29	23.1	31	21.8	19.4	29.5	24.1	29.9	20.4	22	32.5	21	32.5	21
17	28.4	22.5	29.5	22.2	31.1	21.4	19.5	29.7	24.5	29.8	21.9?	23.8	31.8	23.1	31.8	23.1
18	29.4	23	30.2	23.6	31	21.3	17.9	31	23.3	29.6	22.8	23	33	22.7	33	22.7
19	27.5	23.7	31.2	24.7	30.5	21.3	19.5	30.7	24.5	28.8	20.3?	22.8	32	22.7	32	22.7
20	30.6	23.4	31.3	23.9	31	21.4	21.5	31	25.2	28.6	23	22.5	32.5	22.2	32.5	22.2
21	29.8	24.7	30.1	23.6	31.5	23.6	19	31	24.9	28.7	21.7	22.5	29.8	22.7	29.8	22.7
22	30	24.6	30.2	24	31	23.7	19	32	25	30.2	23.5	24.6	29.9	24	29.9	24
23	29.1	23.4	30.7	23.5	31.4	22.3	19.4	33.2	25.2	29.6	22.5	23.2	32.8	24.1	32.8	24.1
24	29.3	24.7	31.5	24.8	31.5	22.5	20.1	30.7	25.1	28.3	22.9	24	35.1	23.2	35.1	23.2
25	29.2	25.2	31.9	24.9	31.5	22.5	21.5	31	25.4	30	21.6	24.6	35.1	24.2	35.1	24.2
26	28.9	23.1	31.6	23.9	31.5	22	19	30.7	25.4	29.9	19.3	22.5	33.3	23.5	33.3	23.5
27	29.9	22.8	30.9	23.3	31.4	22	20.6	30.4	24.4	28.7	21.9	21.8	32.7	21.4	32.7	21.4
28	29.5	24	31.7	23.2	31.4	22.1	22.2	30.4	25.1	28.5	21.6	21.8	32.3	23.2	32.3	23.2
Mean	29.1	23.1	30.6	23.5	30.5	22	20.6	30.3	24.7	29.1	21.6	23.2	32.3	22.7	32.3	22.7

Maximum and minimum temperatures for third-class and rain stations, February, 1913—Continued.

Date.	Laoang.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.		Santa Cruz, Laguna.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
1	28.6	21.5	28.8	24	26.5	22.4	29.9	21.5	29.4	20.6	26.3	20.4	27.7	18.2	27.6	21.5
2	28.9	-----	28	23.8	27.1	21.7	30.8	21.6	29.6	20.2	29	18.7	27.9	19.5	27.1	21.5
3	29.3	-----	27.8	23	28.5	21	31	22	31.3	20.7	30.9	17.8	27.5	19.1	28.9	21
4	29.2	-----	28	23	29.5	21	30.9	21.8	31	18.7	31.3	19.7	27.6	18.3	29.6	21.8
5	30	-----	27.4	23.6	29.4	22.5	26.5	22	31	20.4	32.1	18.7	28	18.6	29.6	21
6	29.2	21.3	27.4	23.6	28.1	23.5	26.5	22.3	27.2	22	31.8	-----	28.5	19	27.8	21
7	29.9	19.5	29.4	22.6	28.6	23.1	30	20.8	31	20.6	30.3	21.1	28.1	19.4	29.2	21.5
8	29.6	-----	28.4	23.4	29.1	21.8	30.1	18.5	31.5	-----	31	20.3	28.9	19.7	30.6	21.8
9	29.8	18.2	29.4	20.4?	29.5	21.5	30	19.9	31.6	18.5	32.3	19.8	28.5	19.2	30.6	22.2
10	30.6	18.6	28?	23	29.5	19.6	30.6	19	32.5	18	31.9	18.3	29	19.9	31	21.5
11	29	20	29	22.8	28.8	20.5	29.7	21.5	30.9	19.7	31.6	17.5	29.6	18.1	28.3	21.6
12	-----	-----	29	19.4	27.5	22.5	28.8	21	27.4	20.4	30	20.7	29	18	27.2	20.1
13	24.3	20.6	25.4	22.4	28	22	29	20.8	30	20.7	30.8	21.7	28.7	18.9	28.5	21.2
14	26.6	20.9	26	23	29.5	22.6	29.5	21	32.3	19.3	32.1	20	30	18.2	30.1	22
15	28.9	18.3	27	23	29.5	21.1	30.2	18.6	32	17.6	32.8	19.6	29.4	19.3	30.1	21.2
16	29.6	18.8	27.2	23	30	21	30.6	19.5	31.2	-----	32.3	20.2	29	19.1	30	21.1
17	30.4	21.5	29.2	23.8	29.6	21	30.9	18.6	32.1	16	31.8	19.6	30.1	18.5	29.9	21.6
18	29.5	17.9	28	23.8	29.5	22.5	30.5	21	30.7	19.2	31.5	21	30.6	18.1	29	21.2
19	29.8	-----	27.4	23	29.1	21.5	31.7	19.1	32	16.5	32.8	19	28.2	19.6	30	20.7
20	30.2	21.2	29.2	23.4	30	23.1	29.8	21	29.3	19.5	32.3	20	30.2	19.3	27.4	20.8
21	29.8	20.3	30	24.4	29.7	24.2	31.6	21.2	32.5	21.9	33.2	21.7	29.6	19.1	28	22.5
22	30.5	-----	29.6	23.6	30	23.3	30	22.5	31.5	19.5	34	22.3	29.1	19.5	31	22.1
23	30.6	19	30	23.8	29.6	24	30.2	20	32	19.5	33.6	22	30.7	19.1	30.9	22.5
24	30.8	-----	29	24	30.2	21.2	30.9	19.5	32	17.4	33.3	20.3	29.9	19	30.5	22.6
25	29.6	20.5	30.4	23.8	29.5	23.1	31	21.5	32.5	22	33.8	21	29.3	19.6	30	21.8
26	30.8	18.7	30.2	22.4	30.6	22	29.4	19.4	31	17.3	32.3	19	31	20.1	31.4	19.6
27	31.1	20.6	28.4	22.6	29.5	20.4	31.7	17.9	32	17	29.7	20	31.3	19.3	27	21.7
28	31.4	20.5	28.8	23.6	29.5	23	31.5	19.6	-----	-----	31.8	20.4	30.8	19.5	29.2	20.9
Mean	29.6	19.9	28.4	23.1	29.1	22	30.1	20.5	31	19.3	31.7	20	29.3	19	29.3	21.4

Date.	Antipolo.		Iba.		Tarlac.		Baler.		San Fernando, Union.		Echagüe.		Candon.		Laoag.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
1	29.3	18.8	32.8	18.3	32.2	18	28	21.6	29.3	18.4	26.7	17	29.9	20.7	32.2	15.7
2	30	18.5	31	21.8	32.2	19.8	27.9	20	29.4	18.5	27.7	18.4	28.4	20.5	32.5	15.8
3	30.8	18.4	30.5	17.3	32.3	20.2	28.2	20.7	29	18	28.3	18.9	27.9	18.8	33.2	16
4	31.9	18.7	31.4	17	32.7	19.4	28.5	20.9	29.1	19	30	18.6	28.6	20.2	29.7	17.5
5	32.6	19.1	31.8	17.5	33	18	28.8	20.4	30.2	18.2	29.9	18	28.5	21	30.7	18.2
6	32	20	31	18.1	32.7	20.2	27.7	21	29.3	19.5	29.2	17.6	28.6	22.1	32.7	18.6
7	32.3	19.3	31.5	20.4	34	20.1	28.7	21.4	30	20.5	26.7	20.2	29.6	23.1	33.7	22.3
8	31.3	20.5	31.9	20	32.7	20.4	27	21.7	30.3	21.3	26	19.9	29.4	22.5	32.1	18.7
9	32.4	19.9	31.6	21.3	32.6	20.8	29	21.2	31.8	21.9	31.1	19.1	29.7	22.5	31	21.1
10	30.8	18.6	31	20.5	33.4	20.4	30.1	19.6	30.6	23	29.7	21	29.8	23.8	31.9	21.7
11	31.7	20.3	30.5	21.1	34.3	23	28.1	22.2	30.6	21.2	26.3	21	30.9	22.4	30.9	22.2
12	30.7	20.4	31.9	22.7	32.3	21.5	26.9	22.4	29.2	20.6	26.3	18	29.2	22	33.2	18.8
13	31	19.3	31.4	21.8	32.5	19.5	27.3	20.5	29.6	20.4	30.3	18.4	29.5	22	31	19
14	32	18.9	31.4	18.5	31.2	18.8	27.3	21.5	31.5	19.6	31.3	19	28.9	21.7	31	17.9
15	32.1	18.7	31.5	19.1	34.8	18.7	28.8	20.5	30.2	20.3	31.7	17.8	29.9	21.7	30.9	21.2
16	32	20.9	31.5	20.1	34	22.8	29.6	21.5	30.4	20.5	31	18.6	28.7	20.5	32.3	19
17	32.1	18.2	32.6	19.4	33.8	19.4	29	20.7	29.5	19.9	29	20.4	29.2	20.5	32.7	14.8
18	30.7	20.3	31.9	18	31.8	18	28.4	22.2	29.8	19.4	30.8	18.4	30.1	21.5	31.2	18.1
19	32.6	19.6	30.9	17.9	33.5	17.8	28.7	21.7	30.5	20.4	31.3	15.7	29.5	22.5	30.6	18
20	33	18.8	31.2	16.6	33.7	18	28.9	18.5	28.8	18.5	30.8	15.7	29.3	22.5	32	19.1
21	32.7	21.2	33.6	20.6	33.1	17.3	27.2	22.1	30.4	20.8	30.2	20.6	29.7	22.2	32	19.1
22	34.1	20.7	33	20.5	34.3	21.8	29.3	22.2	34.2	20.3	32.8	21.6	30.3	22.4	32.6	21
23	33.8	20.3	32	21.5	35	19.5	29.2	20.3	31.3	22.1	33.4	18.7	29.6	22.4	32.6	21.3
24	33.4	21.3	32.1	21	35.2	19	29.5	19.1	31.9	22.3	33	17.4	29.9	22.4	33.3	22.8
25	34	18.7	31.7	19.3	36	19.2	29.1	21.8	31	21.5	32.4	21	29.9	24	32.3	20.7
26	33.4	19.2	31.3	19.5	35.8	21.6	30.8	21	31.1	21.7	29.7	22.1	29.8	22.6	32	22.6
27	31.7	21	31	19.8	35.2	22	30	22.2	30.5	20.5	28.8	21.5	29.9	21	31.8	21.9
28	31.5	19.7	31	21	35.6	21.8	30.2	21.4	31.3	21.2	28.9	20.4	29.8	21.7	32	19.1
Mean	32	19.6	31.6	19.7	33.6	19.9	28.6	21.1	30.4	20.3	29.8	19.1	29.4	21.8	31.9	19.4

# SEISMOLOGICAL BULLETIN FOR FEBRUARY, 1913.

By Rev. MIGUEL SADERRA MASÓ, S. J.,  
*Assistant Director of the Weather Bureau.*

## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

- 1, 15<sup>h</sup> 57<sup>m</sup> [1, 23<sup>h</sup> 57<sup>m</sup>]. Sarangani (S Mindanao). Earthquake of intensity III.
- 3, 2<sup>h</sup> 25<sup>m</sup> 48<sup>s</sup> \* [3, 10<sup>h</sup> 25<sup>m</sup> 48<sup>s</sup>]. NE of Mindanao. An earthquake felt throughout the peninsula of Surigao, in the north of the Agusan valley, and in the Island of Leyte. Its origin was in the Pacific not far from the NE coast of Mindanao. In Surigao and district it had an intensity V and there was a repetition of intensity III a short time after the main shock. To the north of the Agusan Valley, some 100 kilometers more to the south the intensity did not pass III-IV, while in Leyte, which is approximately the same distance to the NNW, the intensity was not greater than II-III.
- 5, 20<sup>h</sup> 56<sup>m</sup> [6, 4<sup>h</sup> 56<sup>m</sup>]. Nueva Caceres (SE Luzon). Oscillatory earthquake of intensity II-III.
- 5, 21<sup>h</sup> 30<sup>m</sup> [6, 5<sup>h</sup> 30<sup>m</sup>]. Sarangani (S Mindanao). Earthquake of intensity III.
- 12, 0<sup>h</sup> 10<sup>m</sup> [12, 8<sup>h</sup> 10<sup>m</sup>]. Isabela (Island of Basilan). Oscillatory earthquake, direction E-W, intensity II-III.
- 12, 20<sup>h</sup> 10<sup>m</sup> [13, 4<sup>h</sup> 10<sup>m</sup>]. Sarangani (S Mindanao). Earthquake of intensity III.
- 15, 18<sup>h</sup> 00<sup>m</sup> [16, 2<sup>h</sup> 00<sup>m</sup>]. Sarangani (S Mindanao). Earthquake of intensity III-IV: there was a repetition at 18<sup>h</sup> 30<sup>m</sup> [16, 2<sup>h</sup> 30<sup>m</sup>] of intensity III.
- 17, 4<sup>h</sup> 51<sup>m</sup> \* [17, 12<sup>h</sup> 51<sup>m</sup>]. Butuan (N Mindanao). Oscillatory earthquake, direction S-N, intensity II-III. This earthquake was also felt in Sarangani with the same intensity. Its origin was probably far out in the Pacific. There was a slight record of it on the seismographs in Manila.
- 17, 22<sup>h</sup> 59<sup>m</sup> 00<sup>s</sup> \* [18, 6<sup>h</sup> 59<sup>m</sup> 00<sup>s</sup>]. Calapan (NE Mindoro). Oscillatory and saltatory earthquake, direction SSW-NNE, intensity IV, and duration 10 seconds.
- 18, 11<sup>h</sup> 10<sup>m</sup> [18, 19<sup>h</sup> 10<sup>m</sup>]. Cotabato (SW Mindanao). Oscillatory earthquake, direction S-N, intensity II-III.
- 20, 19<sup>h</sup> 10<sup>m</sup> [21, 3<sup>h</sup> 10<sup>m</sup>]. Davao (SE Mindanao). Oscillatory earthquake direction NE-SW, intensity IV, duration 8 seconds. This earthquake was also felt slightly in Butuan; its origin was probably to the north of the Gulf of Davao.
- 21, 0<sup>h</sup> 50<sup>m</sup> [21, 8<sup>h</sup> 50<sup>m</sup>]. Sarangani (S Mindanao). Earthquake of intensity III.
- 24, 4<sup>h</sup> 31<sup>m</sup> [24, 12<sup>h</sup> 31<sup>m</sup>]. Baguio (W Luzon). Oscillatory saltatory earthquake of intensity II-III.
- 24, 18<sup>h</sup> 25<sup>m</sup> [25, 2<sup>h</sup> 25<sup>m</sup>]. Batangas (S Luzon). Oscillatory earthquake, direction SW-NE, intensity II-III, duration 3 seconds.

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observers who sent the report. All time indications are in Greenwich mean time (Midnight=0<sup>h</sup>), insular time being added in brackets for the convenience of Philippine readers.

25, 4<sup>h</sup> 50<sup>m</sup> [25, 12<sup>h</sup> 50<sup>m</sup>]. Sarangani (S Mindanao). Earthquake of intensity III.

26, 0<sup>h</sup> 45<sup>m</sup> [26, 8<sup>h</sup> 45<sup>m</sup>]. Waloe (S of the Agusan Valley, Mindanao). Earthquake of intensity II-III.

26, 17<sup>h</sup> 40<sup>m</sup> [27, 1<sup>h</sup> 40<sup>m</sup>]. Cebu. Earthquake of intensity II-III.

27, 1<sup>h</sup> 19<sup>m</sup> 00<sup>s</sup> \* [27, 9<sup>h</sup> 19<sup>m</sup> 00<sup>s</sup>]. Butuan (N Mindanao). Oscillatory earthquake, direction WSW-ENE, intensity V, duration 15 seconds. As this earthquake was so intense and was registered in Manila, it is probable that it was also felt in a great part of the Agusan Valley and in the subprovince Bukidon in the west.

#### RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0<sup>h</sup>. Instrument: Wiechert seismograph; 1,000 kilograms.  $A_N$ :  $T_n=5.3$ ,  $\epsilon=1.98$ ,  $\frac{r}{T_0^2}=0.054$ ;  $A_E$ :  $T_0=6.4$ ,  $\epsilon=3.23$ ,  $\frac{r}{T_0^2}=0.024$ . Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
45	1	I <sub>d</sub>	eP L M <sub>N</sub> F	h. m. s. 3 02 12 03 30 03 32 06	1	37		
46	2	I <sub>d</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	5 48 27 48 33 48 45 48 45 54	3 2-3	220 168		
47	2	I <sub>d</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	12 03 42 04 01 04 03 04 03 08	1 1-2	183 66		
48	3	I <sub>v</sub>	eP F	2 25 48 37				NE of Mindanao.
49	6	II <sub>d</sub>	eP i L	9 18 31 18 47 18 49				Maximum and end lost by the pens thrown off through the force of shock.
50	7	I <sub>r</sub>	eP L M <sub>N1</sub> M <sub>N2</sub> M <sub>E</sub> F	3 08 00 13 32 13 54 15 53 16 10 4 28	6-7 5-6 7 11	111 69 26		Origin in the Pacific, E of Mariana Islands.
51	11	I <sub>r</sub>	e F	21 51 08 22 07				Horizontal Pendulums.
52	11	I <sub>r</sub>	e F	23 38 49 59				Do.
53	14	I <sub>r</sub>	eP M <sub>N</sub> F	19 00 28 11 23 24	10	9		
54	15	I <sub>r</sub>	L M <sub>N</sub> F	19 20 02 20 28 36	7	14		
55	17	I <sub>v</sub>	e F	4 51 5 06				Butuan (N of Mindanao).
56	17	I <sub>v</sub>	eP L M <sub>E</sub> M <sub>N</sub> F	22 59 00 59 13 23 00 54 01 06 16	7 5-6	107 75		Calapan (NE of Mindoro).
57	20	I <sub>r</sub>	eP L M <sub>E</sub> M <sub>N</sub> F	9 05 44 10 48 13 00 13 44 10 01	7 6	74 60		
58	21	I <sub>d</sub>	eP L M <sub>E</sub> F	17 06 21 06 44 06 47 17	1	65		

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
59	23	I	e F	<i>h. m. s.</i> 14 33 49				
60	23	I <sub>d</sub>	eP L F	17 29 44 30 06 33				
61	25	I <sub>d</sub>	eP L F	6 20 14 20 29 30				
62	25	I	e F	14 27 49 50				
63	27	I	e F	1 19 37				Butuan (N of Mindanao).
64	27	I <sub>r</sub>	eP L M <sub>E</sub> M <sub>N</sub> F	21 17 34 22 52 24 00 24 04 38	6-7 7		15	

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

1, 15<sup>h</sup> 57<sup>m</sup> [1, 23<sup>h</sup> 57<sup>m</sup>]. Sarangani (S de Mindanao). Temblor de tierra de intensidad III.

3, 2<sup>h</sup> 25<sup>m</sup> 48<sup>s</sup> \* [3, 10<sup>h</sup> 25<sup>m</sup> 48<sup>s</sup>]. NE de Mindanao. Temblor de tierra sentido en toda la península de Surigao, parte N del Valle del Agusan y en la isla de Leyte. Su origen se hallaba en el mar Pacífico, no lejos de la costa NE de Mindanao. En Surigao y sus cercanías tuvo intensidad V y se experimentó poco después una repetición de intensidad III. Al N del valle del Agusan, distante unos 100 kilómetros hacia el S, no pasó de intensidad III-IV, mientras que en la isla de Leyte, próximamente a la misma distancia hacia el NNW, su intensidad no fué superior al grado II-III.

5, 20<sup>h</sup> 56<sup>m</sup> [6, 4<sup>h</sup> 56<sup>m</sup>]. Nueva Cáceres (SE de Luzón). Temblor oscilatorio de intensidad II-III.

5, 21<sup>h</sup> 30<sup>m</sup> [6, 5<sup>h</sup> 30<sup>m</sup>]. Sarangani (S de Mindanao). Temblor de tierra de intensidad III.

12, 0<sup>h</sup> 10<sup>m</sup> [12, 8<sup>h</sup> 10<sup>m</sup>]. Isabela (Isla de Basilan). Temblor oscilatorio, dirección E-W, intensidad II-III.

12, 20<sup>h</sup> 10<sup>m</sup> [13, 4<sup>h</sup> 10<sup>m</sup>]. Sarangani (S de Mindanao). Temblor de tierra de intensidad III.

15, 18<sup>h</sup> 00<sup>m</sup> [16, 2<sup>h</sup> 00<sup>m</sup>]. Sarangani (S de Mindanao). Temblor de tierra de intensidad III-IV: repitió a 18<sup>h</sup> 30<sup>m</sup> (16, 2<sup>h</sup> 30<sup>m</sup>) con intensidad III.

17, 4<sup>h</sup> 51<sup>m</sup> \* [17, 12<sup>h</sup> 51<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección S-N, intensidad II-III. Este temblor se sintió también en Sarangani, con la misma intensidad. Su origen probablemente se hallaba algo lejos en el Pacífico: lo registraron muy débilmente los seismógrafos de Manila.

17, 22<sup>h</sup> 59<sup>m</sup> 00<sup>s</sup> \* [18, 6<sup>h</sup> 59<sup>m</sup> 00<sup>s</sup>]. Calapan (NE de Mindoro). Temblor oscilatorio y susultorio, dirección SSW-NNE, intensidad IV, duración 10 segundos.

18, 11<sup>h</sup> 10<sup>m</sup> [18, 19<sup>h</sup> 10<sup>m</sup>]. Cotabato (SW de Mindanao). Temblor oscilatorio, dirección S-N, intensidad II-III.

20, 19<sup>h</sup> 10<sup>m</sup> [21, 3<sup>h</sup> 10<sup>m</sup>]. Davao (SE de Mindanao). Temblor oscilatorio, dirección NE-SW, intensidad IV, duración 8 segundos. Este temblor fué también sentido muy débilmente en Butuan: su origen se hallaba probablemente al N del Golfo de Davao.

21, 0<sup>h</sup> 50<sup>m</sup> [21, 8<sup>h</sup> 50<sup>m</sup>]. Sarangani (S de Mindanao). Temblor de tierra de intensidad III.

24, 4<sup>h</sup> 31<sup>m</sup> [24, 12<sup>h</sup> 31<sup>m</sup>]. Baguio (W de Luzón.) Temblor oscilatorio y susultorio de intensidad II-III.

24, 18<sup>h</sup> 25<sup>m</sup> [25, 2<sup>h</sup> 25<sup>m</sup>]. Batangas (S de Luzón). Temblor oscilatorio, dirección SW-NE, intensidad II-III, duración 3 segundos.

25, 4<sup>h</sup> 50<sup>m</sup> [25, 12<sup>h</sup> 50<sup>m</sup>]. Sarangani (S de Mindanao). Temblor de tierra de intensidad III.

26, 0<sup>h</sup> 45<sup>m</sup> [26, 8<sup>h</sup> 45<sup>m</sup>]. Waloe (S del Valle del Agusan, Mindanao). Temblor de tierra de intensidad II-III.

26, 17<sup>h</sup> 40<sup>m</sup> [27, 1<sup>h</sup> 40<sup>m</sup>]. Cebú. Temblor de tierra de intensidad II-III.

27, 1<sup>h</sup> 19<sup>m</sup> 00<sup>s</sup> [27, 9<sup>h</sup> 19<sup>m</sup> 00<sup>s</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección WSW-ENE, intensidad V, duración 15 segundos. Faltan datos para determinar la extensión de este terremoto: la mucha intensidad que tuvo en Butuan y el haberse registrado en Manila inducen a creer que debió ser perceptible en gran parte del valle del Agusan y de la subprovincia de Bukidnon situada al W.

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.







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## BULLETIN FOR MARCH, 1913.



# METEOROLOGICAL BULLETIN FOR MARCH, 1913.

By Rev. JOSÉ CORONAS, J. S.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

**Pressure and temperature.**—The mean atmospheric pressure of the month was decidedly less than that of last year in all the stations of the Philippines, the differences being generally above 1.5 mm. In Manila the monthly mean differed from the March normal by  $-0.92$  mm. and from the mean of March, 1912, by  $-1.57$  mm. The highest pressures were recorded with few exceptions on the 1st and 28th, the lowest on the 9th.

The mean temperature of the month scarcely differed from that of last year, the greatest differences being  $+0.6^{\circ}$  C. at Tacloban and  $-0.6^{\circ}$  C. at Tuguegarao. The extreme values for Manila were  $35.2^{\circ}$  C. on the 18th and  $18.9^{\circ}$  C. on the 3d.

### PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR MARCH, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from March, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from March, 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		°C.	°C.	°C.		°C.	
Tagbilaran	759.03	-1.47	760.13	27	757.25	9	26.1	0	34.9	29	19.2	30
Surigao	59.10		60.18	28	57.69	9	25.9		33.4	14	20	5
Cebu <sup>a</sup>	59.10		60.40	28	57.46	9	27.1		31.1	12, 14	23	8, 27
Iloilo	58.68	-1.73	60.13	27	56.67	9	26.9	-0.4	33	9	21.2	22
Ormoc	59.17	-1.71	60.53	1	57.37	9	26.2	+ .2	33	18, 30, 31	18.9	21
Tacloban	59.54	-1.65	60.80	28	57.78	9	27	+ .6	33.6	31	22	2, 3
Capiz	59.22	-1.92	60.63	28	57.11	9	26.6	- .3	33	24	20	22
Calbayog	59.37	-1.80	60.59	28	57.48	9	25.9	+ .2	35.6	25	19.3	21
Legaspi	59.75	-1.78	61.14	28	57.69	9	26.9	- .4	32.8	22	177	25
Atimonan	59.74	-1.77	61.61	1	57.59	9	26.3	- .2	32.1	26, 30	20.4	25
Ambulong, Tanauan	59.20		61	1	57.09	9	27		36	13	19.5	21
Paracale	60.13	-1.69	61.76	1, 2	57.79	9	26.1	- .2	32	24	20.1	23
Manila	59.59	-1.57	61.22	1	57.36	9	26.5	- .4	35.2	18	18.9	3
San Isidro	59.75	-1.61	61.44	1	57.47	9	27.2	- .1	37.4	21	18.4	17
Dagupan	58.93	-1.66	60.72	1	57.01	9	27.5	+ .3	37.2	30	20.2	27
Bolinao	59.24	-1.53	60.99	1	57.34	9	27.6	+ .3	34.9	19	21	3
Baguio <sup>b</sup>	637.05	-1.22	638.43	28	635.57	9	18.2	- .2	26.6	16, 19	12.5	2
Vigan	759.26	-1.68	761.14	1	757.21	9	27.1	+ .3	34.3	22	19.9	2
Tuguegarao	60.18	-1.44	63.33	2	57.91	9	26.2	- .6	37.4	20	17.4	2
Aparri	60.32	-1.12	63.38	1	58.12	9	25.4	0	33	20	20.6	2

<sup>a</sup>28 days of observation.

<sup>b</sup>The barometric readings of this station are not reduced to sea level.

**Rainfall.**—Thirteen stations had less rainfall than last year, but this is due to the great scarcity of rain last year, for comparing the rainfall of the month with the normal for the month very few positive differences are found. In Manila 15.8 mm. were collected in the gauges, and though this quantity is greater than that of March, 1912, by 13.2 mm., it is less than the normal by 2.6 mm.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF MARCH, 1913.

Station.	Total.	Departure from March, 1912.	Departure from normal.	Rainy days.	Departure from March, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from March, 1912.	Departure from normal.	Rainy days.	Departure from March, 1912.	Greatest rainfall in a single day.	Day.
Jolo.....	mm.	mm.	mm.			mm.		Calapan.....	mm.	mm.	mm.			mm.	
Isabela, Basilan.....	102	+124.6	+28	15		42.7	21	Virac.....	31.7	-50.1		12	+4	13.5	17
Zamboanga <sup>a</sup> .....	126.4			14	+13	53.6	13	Nueva Caceres <sup>b</sup> .....	59.4	-10.4		13	-4	14.2	7
Davao.....	103					25.1	14	Batangas.....	2.9						
Cotabato.....	125.7	+87.1	-24.2	11	+8	53.3	15	Atimonan.....	5.9	+5		1	-2	5.9	1
Cagayan, Misamis.....	76.2	+65.4	+3.5	9	0	23.1	15	Ambulong, Tanauan.....	57.4	+31.7	-22.8	8	+4	22.9	3
Dapitan.....	2	1.3		1	0	2	20	Silang.....	7.9			3		4.6	13
Butuan.....	28.3		-37.4	4		14.5	15	Paracale.....	2.5	-3.4		1	-1	2.5	7
Dumaguete.....	70.6	-2.1	-77	16	-1	10.9	1	Sta. Cruz, Laguna.....	116.1	+10.6		14	0	22.9	5
Yap, W. Carolines.....	3.6	.2		3	+1	1.3	14, 19	Manila.....	3.3	-27.1		5	-5	1.3	5
Tagbilaran.....	47.9	+21.3		14	-4	13.7	11	Antipolo.....	15.8	+13.2	-2.6	4	+1	12.2	5
Surigao.....	46	+41.4	-25.8	5	+3	26.2	10	Iba.....	4.8	+1.3		3	+1	3.3	7
Maasin.....	161.4	+28.9	-104.2	21	+3	28.2	16	San Isidro.....	2.8	+3		3	0	2	4
Cebu <sup>a</sup> .....	42.2	+24.7	-54.3	4	+2	20.1	7	Tarlac.....	1.9	-3.4	-11.1	3	+2	8	4, 25
Iloilo.....	3.7					2.1	8	Baler.....	9.7	0	-14.1	1	0	9.7	7
San Jose Buenavista.....	23.9	+15.5	-6.1	4	+2	17	1	Dagupan.....	104	-1		13	-3	27.7	5
Cuyo.....	23.7	+23.2		3	+2	22.1	7	Bolinao.....	34.2	+30.4	+4	2	+1	32.8	7
Ormoc.....	0	3.3		0	1	0	0	Baguio.....	5.3	+5	-8.1	1	0	3	31
Tacloban.....	80.8	+72.8	+2.5	11	+4	34.8	22	Echague.....	22.9	+21.9	-16	4	+3	18.5	7
Capiz.....	57.7	+14	-18.3	3	-1	5.3	28	Candon.....	0	-3.6	-8.4	0	-1	0	0
Borongan.....	5.6	11.6		10	0	16.2	22	Vigan.....	44.2	+34.8		11	+9	12.7	10
Calbayog.....	90.3	+27.7	-127.2	23	+2	19.1	10	Tuguegarao.....	6.1	+6.1		2	+2	4.3	5
Masbate.....	63.4	+50.7	-39.7	10	+6	10.9	7	Laoag.....	0	0	-3.6	0	0	0	0
Romblon.....	19.3	+5.2		5	-1	10.9	2	Aparri.....	32.5	+26.9	+6	8	+6	13.5	4
Laoang <sup>b</sup> .....	8.4	-13.5		4	-3	6.6	6	Sto. Domingo, Batanes.....	0	0		0	0	0	0
Legaspi.....	28.6					13.5	5		123.2	+107.6	+70.7	12	+9	34.7	5
Sumay, Guam.....	91.9	+15.9	-80.7	16	+4	22.9	7		370.5	+314.6		18	+12	56.9	7
	25.4	+9.4		7	0	6.4	2								

<sup>a</sup>28 days of observation.<sup>b</sup>23 days of observation.

## DEPRESSIONS AND TYPHOONS.

As in the previous two months, so also in this it was not necessary to issue any notice or warning of typhoons or depressions which would have any importance for the Philippines. There were a few depressions in the Gulf of Tongking and north of Indochina, in the Eastern Sea, in the neighborhood of the Loochoos and in Japan, but only one in the north of Japan was of real importance.

## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes resulta para todas las estaciones de Filipinas bastante menor que la del año pasado. Las diferencias son casi en todas partes mayores de 1.5 mm. El promedio de Manila se diferencia de la normal de Marzo en  $-0.92$  mm., y de la media de Marzo, 1912, en  $-1.57$  mm. Las mayores presiones ocurrieron, salvo raras excepciones, los días 1 y 28: las más bajas se observaron en todas partes el día 9.

Las temperaturas medias mensuales apenas difieren de las del año pasado, siendo las mayores diferencias  $+0.6^{\circ}$  C. para Tacloban y  $-0.6^{\circ}$  C. para Tuguegarao. Los valores extremos para Manila fueron  $35.2^{\circ}$  C. y  $18.9^{\circ}$  C. registrados los días 18 y 3 respectivamente.

**Precipitación acuosa.**—En la tabla que como de costumbre acompaña el texto inglés solamente hallamos trece estaciones que nos den este mes un total de lluvia menor que el año pasado. Esto es debido a la escasez de lluvia del año pasado, pues comparando los mismos totales de este año con la normal de Marzo son muy pocas las estaciones que aparecen con diferencias positivas. En los pluviómetros del Observatorio Central no se han recogido más de 15.8 mm. de agua, cantidad mayor que la de Marzo, 1912, en 13.2 mm. y menor que la normal de este mes en 2.6 mm.

## DEPRESIONES Y TIFONES.

Al igual que los dos meses anteriores se pasó todo el mes de Marzo sin que el observatorio hubiese de anunciar tifón o depresión alguna que fuese de alguna importancia para Filipinas. En el Golfo de Tongking y norte de Indochina, en el Mar del Este, en los alrededores de las Islas Loochoos y en Japón se observaron durante el mes varias depresiones, si bien solamente en el norte de Japón apareció alguna de ellas con caracteres de verdadera importancia.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied,  $-1.72$  mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.			Free expo- sure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.				
1	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.
2	761.22	25.8	30	21.8	26.8	28.2	27.9	28	27.9	28	75	18.4	3.3	1.6
3	60.86	25.8	33.2	20.7	26.5	28.7	27.8	28	27.9	28	66.1	15.8	5.9	5.6
4	60.22	25.3	32.4	18.9	26.4	28.6	27.9	28.3	21.8	27.9	71.9	17.1	5.6	4.4
5	60.14	25.8	30.6	22.6	26.5	28.4	28.1	28.5	27.9	28.1	76.3	18.6	2.6	2.4
6	59.99	25.3	31.9	21.4	26.7	28.5	28.1	28.3	28	28.2	82	19.3	2.7	2.5
7	59.75	25.7	32.2	21.4	26.6	28.4	28	28.1	27.9	28	81.4	19.8	2.8	2.4
8	59.10	25.6	32.2	21.2	26.8	28.6	27.9	28.2	28	28	80.6	19.4	3.2	2.6
9	57.98	26.6	33.4	21.8	27.1	29	28	28.5	28	28	78.4	20	4.7	3.8
10	57.36	27	34.1	21.6	26.7	29.3	28.4	28.6	28	28.1	75.6	19.7	4.6	3.5
11	58.54	26.9	33.6	21.8	27.8	29.8	28.5	28.8	28	28	73.6	19.1	5.7	4.3
12	58.95	26.5	33.4	20.6	27.1	29.2	28.5	28.8	28	28	70	17.7	6.5	4.2
13	58.78	26.5	33.4	20.1	27.4	29.8	28.7	28.8	28.1	28.1	72.3	18.5	4.8	3.6
14	58.60	27.8	34.4	23.2	28.5	30.7	29	29.1	28.1	28.1	74.9	20.5	5.8	3.9
15	59.44	27.5	33.8	23.3	29.2	31.2	29	29.8	28.1	28.2	70.6	19	5.3	4.2
16	59.59	26.7	33.9	21.2	29	30.8	29.6	29.8	28.1	28.2	68.6	17.7	5.9	4.9
17	59.30	27.2	34.1	20.7	28.4	30.7	29.5	29.8	28.1	28.1	61.7	16.2	8.1	6.2
18	59.43	26.2	33.9	19.3	28.2	30.9	29.5	29.8	28.1	28.1	63.9	15.8	7.5	5.4
19	59.25	26.5	35.2	20.5	28.6	30.8	29.6	30	28.2	28.2	68.9	17.3	6.8	5.1
20	59.16	26.3	33.7	19.8	28.3	30.5	29.4	29.8	28.3	28.2	65.3	16.3	7.2	5.6
21	59.64	27.4	34	21.3	28.7	30.7	29.5	29.8	28.3	28.1	58.7	15.4	8.7	6.4
22	58.29	26.7	35	19	28.8	31.5	29.6	29.8	28.3	28.1	61.4	15.8	7	5.2
23	58.31	26.8	33.6	21.2	28	31.7	29.7	30.1	28.3	28.3	74.4	19.1	5.3	3.8
24	58.22	26.7	34.1	21.4	29.3	31.8	30	30.1	28.3	28.2	71	18.2	6.9	4.7
25	59.89	26.8	34.1	19.6	29.3	31.8	29.9	30.2	28.4	28.3	64.9	16.7	6.6	5
26	60.39	27.1	34.4	22.3	30.1	31.5	30.1	30.5	28.5	28.3	69.1	18.2	6.6	4.9
27	60.55	26.4	32.4	22.1	30.2	31.8	30.2	30.7	28.5	28.4	64.3	16.1	6.6	5.3
28	61	26.1	33.5	21	29.1	31.4	30	30.2	28.5	28.2	66.4	16.4	6.2	4.8
29	61.14	26.3	33.9	19.6	28.8	31.6	29.9	30.1	28.5	28.2	68.4	16.9	6.7	4.9
30	60.81	26.9	34.3	20.6	29.5	31.6	29.9	30.1	28.6	28.2	68.5	17.8	5.4	4.2
31	60.77	26.8	34	21.6	29.5	31.5	30	30.4	28.6	28.3	66.6	17	6	4.6
31	60.54	26.2	32.8	20.4	28.9	31.5	30	30.2	28.7	28.2	72.1	18	4.9	3.8
Mean	759.59	26.5	33.4	21	28.2	30.3	29.1	29.4	28.2	28.1	70.4	17.8	5.7	4.3
Total													175.9	133.3
Departure from normal	-0.92	-0.1	+1	-0.3							-1.2	-0.4		

Day.	Wind.				Amount (mean).	Clouds.			Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.
	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.		Form and its direction.					
						Upper.	Lower.				
1	Variable	Km. 74	Km. 9	SSW, WSW	0-10.	A.-Cu.	Cu.	E	h. 1	m. 50	d° p.
2	SW quad.	130	17	SSW	2	Ci.	Cu.	E	9	40	≡° a.
3	NE	187.5	24	NE	4.8	Ci.	Cu.	E	8	20	
4	Variable	82.5	8	NW	8.8	A.-Cu.	Cu., N.-cf.	E	3	05	1.3
5	NW quad.	113.5	14	NW	8.8	A.-Cu.	S.-cu., N.-cf.	E	4	40	12.2
6	Variable	88	8	NW	8.8	A.-Cu.	Cu.-N.	E	2	20	.5
7	W, SE	133.5	17	SSE	8.8	Ci.	Cu.-N.	E	4	20	1.8
8	SSE	149	16	SSE	4	Ci.	Cu.	E	9	20	
9	WNW, ESE	132.5	14.5	ESE	5.5	Ci.	Cu.	E	7	30	
10	SSE	211	21	SE	6.8	Ci.	Cu.	E	6	35	
11	ESE	241	28	SE	3.9	Ci.	Cu.	E	9	05	
12	NE, W	193	18	WNW	2.5	Ci.-S.	Cu.	E	9	00	
13	NNE, SE	198	17	WNW	3.8	Ci.	Cu.	E	9	25	
14	N, SSE	191.5	18	SE	5.4	Ci.	Cu.	E	7	35	
15	E	226.5	27	ESE	4.2	Ci.	Cu.	E	8	35	
16	SE	305.5	25	SE	3.2	Ci.	Cu.	E	9	30	
17	ESE	243.5	26	SE	2.4	Ci.	Cu.	E	9	05	
18	SE	243	21	SE	4.3	Ci.	Cu.	E	8	00	
19	E	276.5	30	SE	4.2	Ci.	Cu.	E	9	10	
20	SE	259	27	SE by S	3.7	Ci.	Cu.	E	9	30	≡° a.
21	SE	166.5	15	SE	1.1	Ci.	Cu.	E	9	20	
22	W quad.	122.5	14.5	W	5.9	Ci.	Cu.	E	7	15	
23	SE	232	28	SSE	2.6	Ci.	Cu.	E	8	30	∞° a.
24	SE	177	16	WNW	2.2	Ci.	Cu.	E	9	45	
25	SE	209	22	SE	4.8	Ci.	Cu.	E	8	00	
26	E, SE	268.5	26	SE	8.6	A.-Cu.	N.-cf.	E	3	35	
27	E quad.	217	21	SE	5.1	A.-Cu.	Cu.-N.	E	7	40	d° a.
28	SE	211.5	19	SE	4.5	Ci.	Cu.	E	9	00	
29	SE quad.	150	17	SE	7.8	Ci., A.-Cu.	Cu.	E	4	55	
30	E	197	23.5	ENE	5.9	A.-Cu.	Cu.	E	5	15	
31	E quad.	193.5	22	SE, E	8.2	Ci.	Cu.-N.	E	3	25	
Mean		187.9	19.7		5.2				7	12	
Total		5,823.5							223	15	15.8
Departure from normal		-1,037.1			+0.7				-5	12	-2.6

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.



METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.<sup>a</sup>

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	760.04	25.3	31.4	22.8	84.5	20.2	E	1	5.2	Ci.-S.	Cu.	SE		d° p.
2.	59.90	26	32.9	21.2	80.2	19.6	NE	1.7	2.8	Ci.	Cu.	E		
3.	59.13	26.5	32.8	20.4	76.7	19.4	E	1.5	1.8	Ci.	Cu.	ESE, SE		
4.	59.14	26.4	33.3	21.9	78.5	19.7	E	1.8	4.2	Ci.-S.	Cu.	E		
5.	58.93	25.7	31.8	21	81	19.8	E	1.2	4	Ci.	Cu.	SE		
6.	58.80	26.5	33.1	20.9	81.7	20.9	E	1.5	2.7	Ci.	Cu.	SE quad.		
7.	58.64	25.7	30	22.8	86.8	21.3	E	1.7	8.8	Ci.-S.	Cu.	SE, E		d° a. p.
8.	57.77	25.4	31.4	22.1	88.3	21.1	E	1	5.3	Ci.	Cu.	SE	9.9	● p.
9.	57.25	25.9	31.9	22	89.5	22.1	NE quad.	1	4.2	Ci.-S., Ci.	Cu.	NE		
10.	58.16	25.5	30.2	21.7	88	21.1	NE, E	1.3	5.8	Ci.-S.	Cu.	E	26.2	● p.
11.	58.72	25.7	31.4	20.9	84	20.5	NE	1.7	3	Ci.	Cu.	ENE, E		
12.	58.70	26.9	31.4	22.6	83.5	21.8	E	1.7	3.7	Ci.	Cu.	SE		
13.	58.48	26.9	31.9	22.7	83	21.6	NE quad.	1.7	4.5	A.-Cu.	Cu.	SE		
14.	59.17	26	32	23.2	89.7	22.4	SE quad.	1	6	Ci.	Cu.	SE quad.	4.6	(2 a. ● [ 4° p.
15.	58.96	26.7	32.3	22.8	83.5	21.6	E	1.8	6	Ci.-S.	Cu.	SE quad.	5.3	● a.
16.	59	25.8	32.3	22	88.3	21.6	SE, E	1.2	6.3	Ci.-S.	Cu.	SE		● p.
17.	58.91	26.2	31.8	22.3	82.2	20.6	SE	1.7	5	Ci.	Cu.	SE		
18.	58.82	26.5	33.5	22.7	79.3	20.1	E	2.5	3	Ci.	Fr.-Cu.	SE		d° a.
19.	58.72?	26.1	31.6	23	84.5	21.1	NE	1.8	6.3	Ci.-S.	Cu.	E		
20.	58.94	26.2	32.3	21.5	80.2	20.1	NE	1.2	5.2	Ci.-S.	Cu.	E		
21.	58.56	25.9	32.8	20.9	82.2	20.1	NE	1.7	3.2	Ci.-S.	Cu.	E		
22.	58.19	26.3	31.6	22.2	82.5	20.9	E	1	4.7	Ci.-S.	Cu.	E, SE		
23.	58.08	26.1	31.7	22.1	81.2	20.1	NE quad.	1.5	3.7	Ci.	Cu.	E		
24.	59.33	26.2	32.3	21.9	79.8	19.8	E	1.7	2	Ci.	Cu.	E		
25.	59.88	26.3	32.7	20.6	82.7	20.7	E	1.5	2.7	Ci.	Cu.	ESE, SE		
26.	59.76	25.9	34.7	21.3	72.2	17.1	NE quad.	2	1.8	Ci.	Fr.-Cu.	SE, SSE		
27.	60.13	25.4	30.8	20.9	79.3	19.2	NE, E	1.3	5	Ci., Ci.-S.	Cu.	SE		
28.	60.12	26.2	33.7	20.1	80.8	20.3	NNE	2	3.7	Ci.	Cu.	SE		
29.	59.88	26.7	34.9	21.1	76.2	19.1	NE quad.	1.2	1.8	Ci.	Fr.-Cu.	E, SE		
30.	60.03	25.4	32.6	19.2	75.7	18	NE, E	1.2	2.7	Ci.	Cu.	E		
31.	59.82	26.4	32.7	20.5	74.3	18.6	NE quad.	1.5	3.5	Ci.	Cu.	E		
Mean	759.03	26.1	32.3	21.7	81.9	20.3		1.2	4.1					
Total													46	

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	759.96	25.6	32	22.4	89.8	21.8	ENE	1.3	10	Ci.-S.		Fr.-N. ESE, ENE	12	● a. p.
2.	59.78	26	31	21.8	83.3	20.6	ENE	1.5	6.7	Ci.-S.		Cu.-N. ENE	8	d a. p.
3.	59.32	24.8	30.1	21.7	88.8	20.6	ENE	1	6.8	Ci.-S.		Cu.-N., Fr.-N. ENE	4.8	● p.
4.	59.11	26	31	21.4	81.5	20	E quad.	1.7	6.3	Ci.-S.		Cu.-N. ESE		
5.	58.84	26.1	31.1	20	80.8	19.9	ENE	1.7	5.2	Ci.-S.	NE	Cu., Cu.-N. ESE	8	d p.
6.	58.92	26.1	32.3	21.6	82.5	20.5	ENE	1.8	6.5	Ci.-S.	NE	Cu.-N. ESE	10.7	d p.
7.	58.84	23.8	27.4	20.9	89.8	19.8	ENE	1.2	7.8	Ci.-S.		Cu.-N. ESE	15	● a. p.
8.	57.97	24	29.7	20.9	87.5	19.3	ENE	1.2	8.8	Ci.-S.		Fr.-N. ESE	25.9	d° a. ● p.
9.	57.69	25.5	31.1	21.1	80.5	19.4	ENE	1.8	9.3	Ci.-S.		Cu.-N. ESE	1.3	● a. d a. p.
10.	58.24	26.1	29	21.8	87	21.8	ENE	1.3	9.2	Ci.-S.		Cu.-N. ESE	8.9	d a. ● p.
11.	58.56	25.6	31.4	20.5	85.7	20.8	ENE	1	5.2	Ci.-S.		Cu.-N. ESE	1.5	d² p.
12.	58.47	26.1	30.1	22.1	84	21	ENE	1.8	5.7	Ci.-S.		Cu.-N. ESE		
13.	58.21	26.7	32.2	21.7	82.8	21.3	NNE	1.5	4.3	Ci.-S.		Cu. ESE		
14.	58.71	27.4	33.4	21.8	80.2	21.4	NE, ENE	1.5	4	Ci.-S.		Cu.		
15.	59.14	26.5	30.6	22.6	86	21.9	ENE	1.7	6.8	Ci.-S.	NE	Cu.-N. ESE	16.5	● a. d p.
16.	59.07	26	30.1	22	84.3	20.9	ENE	2.2	10	Ci.-S.		Fr.-N. E	28.2	● a. ●² p.
17.	59.12	25.6	30.9	20.5	85.5	20.8	ENE	1.3	4.5	Ci.-S.	NE	Cu. ESE	1.3	● p.
18.	58.96	27.4	31.5	24.2	80.7	21.7	ENE	2	4	Ci.-S.	NE	Cu.-N. ESE	5.1	
19.	58.66	26.4	30.3	24	82.7	21	NE quad.	2.2	6.7	Ci.-S.	NE	Fr.-N. ESE	2.5	d° ● a.
20.	59.18	25.4	31.2	21.3	85.5	20.5	ENE	2	4	Ci.-S.		Cu. ESE		d² a.
21.	58.78	26.2	31.6	21.8	84.7	21.2	ENE	1.7	2.8	Ci.-S.		Cu. NE		
22.	58.57	25.1	30	22.6	90.7	21.4	NE quad.	1.2	4.5	Ci.-S.		Cu.-N., Fr.-N. ESE	16.3	● p.
23.	58.48	26	30.4	22.3	87	21.6	ENE	1.3	7	Ci.-S.		Cu.-N. ESE		● a.
24.	59.48	26.5	31.5	22.6	82.7	20.9	ENE	1.3	3.5	Ci.-S.		Cu. ESE	1.5	● a.
25.	59.98	26	31.4	22.9	83.8	20.7	NE quad.	1.5	3.8	A.-Cu.	NE	Cu. ESE		
26.	59.88	26.8	30.2	23.6	78.2	20.2	NE quad.	2.3	4	A.-Cu.	A.-Cu.	Cu., Cu.-N. ESE		
27.	59.96	25.7	30.1	22.5	86	21	ENE	1.3	6.8	A.-Cu.	SE	Cu. ESE	4.5	● a.
28.	60.18	26.4	31.2	22.2	83.2	21	NE quad.	1.8	4.8	Ci.-S.		Cu.-N. NE	1.5	● a.
29.	59.99	25.5	30.5	22.3	89.3	21.6	ENE, NE	1.8	4.3	Ci.-S.		Cu.-N. NE		
30.	60.04	26.2	29.7	22.4	85.8	21.6	ENE	1.8	5	Ci.-S.		Cu.-N. NE		
31.	59.86	26.4	31.2	22.1	80.7	20.3	NE quad.	1.2	5.5	Ci.-S.		Cu. NE	2.3	● a.
Mean	759.10	25.9	30.8	22	84.5	20.9		1.3	5.9					
Total													161.3	

<sup>a</sup> All the mean values given in these tables are deduced from six daily observations.

## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
							Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1												
2												
3												
4	759.20	26.8	30.5	24.3	71.7	18.6	N quad.	364	2.7	Ci., Ci.-S.	Cu.-N. ENE	
5	59.08	26.8	29.6	24	68.8	17.9	NNE	315.8	3.5	Ci.	Cu., Cu.-N. E	
6	58.81	27	30.6	23.3	70.7	18.4	NNE	333.1	2	Ci., Ci.-S.	Cu. ENE	d <sup>2</sup> a.
7	58.76	26.4	29.6	24.1	77.3	19.7	NE quad.	233.7	8.5	Variable.	Cu.-N. E	d a. p.
8	57.88	25.7	31	23	79.5	19.4	NNE	309.5	3.2	Ci.-S.	Cu. E	d <sup>2</sup> p.
9	57.46	27	30.2	23.1	76	20	NE quad.	304.3	2.7	Ci., Ci.-S.	Cu.-N. E	
10	58.35	26.9	30.5	24	71.5	18.8	NNE		3.7	Ci.-S.	S.-Cu.	d a. ∞ p.
11	58.76	27.1	30	23.7	68.5	18.2	N quad.	352.2	.7	A.-Cu.	Cu. ENE	
12	58.60	27.8	31.1	24.7	72.5	19.9	N quad.	281.6	.3	Ci.	Cu. EbyN	≡° a.
13	58.39	28	30.8	25.3	76.2	21.3	NE	191.7	3.5	A.-Cu.	Cu.-N. EbyN	
14	58.98	27.9	31.1	25.7	77.2	21.4	NNE, NE	307.9	4.2	A.-Cu.	Cu.-N. SE, E	d a. p. [4] p.
15	59.16	27.6	30.1	25.1	72.2	19.7	NNE	523.9	1.5	Ci.	Cu.-N. ENE	
16	59.04	27.7	30.7	24.7	66.2	18.1	NNE	504.7	.5	Ci.	Cu. ENE	
17	59.11	27.3	30.5	24	72.7	19.4	NNE	384.4	3.8	Ci.	Cu.	d a.
18	59.10	27.6	30.9	24.6	63.3	17.1	NNE	391	.8	Ci.	Cu. ENE	∞ p.
19	58.76	27.1	30	24.2	72	19	NE	535	5.5	Ci.	Cu.-N. ENE	d a. ∞ p.
20	59.36	27.2	30	24.3	71.5	19.1	NNE	424.9	4	Ci.	Cu.-N. E	●° a. ∞ p.
21	58.71	26.7	29.9	23.7	65.8	17	NE	357.3	1	Ci.	Cu.	∞ p.
22	58.18	27.5	31	25	72	19.5	Variable	296.5	3	Ci.-S.	S.-Cu. ESE	
23	58.14	27.1	29.8	24.5	73.2	19.3	NNE	373.4	.7	Ci.	Cu. ENE	.3
24	59.70	27.6	31	25	60.7	16.4	NE quad.	339.6	.3	Ci.	Cu. ENE	d a.
25	60.08	26.9	29.5	24.3	70.7	18.6	NNE	420	3.7	A.-Cu., Ci.	Cu.-N. NE	d° p.
26	60.06	27.2	30	24.6	64.8	17.3	NE	507.4	1.2	Ci.	Cu.-N. ENE	
27	60.39	26	29	23	71	17.8	NNE	397.5	5.8	Ci.-S.	Cu.-N. ENE	1
28	60.40	26.8	30	23.8	70.8	18.4	NNE	332.1	2.8	Ci., Ci.-S.	S.-Cu., Cu.	d a.
29	60.14	27.4	30	24.6	67.5	18.2	NNE	466.4	.2	Ci.	Cu.	
30	60.33	27.3	30.6	24.1	64.2	17.1	NNE	436.3	.3	Ci.	Cu.	
31	59.95	27.2	30.2	24.5	66.8	17.8	NE quad.	469.7	1.7	Ci.	Cu. NE	○ a.
Mean	759.10	27.1	30.3	24.3	70.5	18.7		376.1	2.6			
Total												3.7 <sup>a</sup>

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
							Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1	759.94	25.2	29.3	21.8	83.3	19.8	NE quad.	459.1	6.3	Ci., Ci.-S.	Cu. NE	● a.
2	59.62	25.6	29.7	22.9	78.8	19	NE	464.9	4.7	Ci., Ci.-S.	Cu.	○ d a.
3	58.94	26.1	29.6	22	72.5	18	NE	428.9	4.7	Ci.	Cu.	● a.
4	58.66	26.5	30.4	23.6	71.3	18	N, NE	473.7	4.7	Ci.	Cu. NE	● a.
5	58.48	26.6	31.1	23.2	73.3	18.7	NE	376.4	3.8	Ci.	Cu.	● a.
6	58.40	26.9	31.2	23.2	72	18.5	N, NE	394.4	3.2	Variable	Cu.	● a.
7	58.26	26.3	30.4	23.6	80.5	20.3	NE quad.	276.1	7	Ci.-S.	Cu.	● a. d p.
8	57.24	27	31	23.4	74.2	19.5	N, NE	324.7	6	Ci.	Cu.	● a.
9	56.67	27.9	33	24.7	71.2	19.6	NE	408.2	5	Ci.	Cu.	● a.
10	57.73	27.6	31.3	23.9	69.5	18.8	N, NE	477	4.5	Ci.	Cu.	● a.
11	58.30	27.5	32.1	23.5	73	19.5	N, NE	454.4	3.8	Ci., Ci.-S.	Cu.	● a.
12	57.97	27.8	32.8	23.6	71.5	19.5	N, NE	346.3	2	Ci.	Cu.	● a.
13	58.14	26.8	32	23.9	75.8	19.8	N	286.8	4.8	Ci., Ci.-S.	Cu.	● a.
14	58.78	27.4	32.5	23.6	73.5	19.8	NE	330.4	4.5	Ci.	Cu.	● a.
15	58.80	27.5	31.6	24.3	70.5	18.8	N, NE	611.8	1.8	Ci.	Cu.	● a.
16	58.36	27.4	31.9	23.7	67.3	17.9	N, NE	587.4	3.2	Ci.-S.	Cu.	● a.
17	58.47	27.4	31.6	24.3	70.7	19	N, NE	503.9	5.7	Ci.-S.	Cu. NE	● a.
18	58.45	27.5	32.1	23.8	69.5	18.6	N, NE	500.7	2.5	Variable	Cu. NE	● a.
19	58.35	25.9	29.8	24.3	82.2	20.3	N	504.2	6.3	Ci.-S.	Cu. NE	● a.
20	58.84	27	30.4	23.5	72.7	19.2	N, NE	446.4	6.3	Ci.-S.	S.-Cu. NE	● a.
21	58.06	26.8	31	23.2	63.8	16.2	N, NE		9.7	Ci.-S.	Cu.	● a.
22	57.93	26.6	32.8	21.2	68.2	17.6	Variable		6.7	Ci.	Cu.	● a.
23	57.53	27.4	32.5	23.5	60.7	16	N, NE	509.1	1.8	Ci.	Cu.	● a.
24	58.98	27.3	32.2	23.4	64.7	17	N, NE	469.2	2	Ci., A.-Cu.	Cu.	● a.
25	58.58	26.6	31.9	22.1	68.3	17.4	NE	525.9	2.5	Ci.	Cu.	● a.
26	59.34	26.8	31	23.5	66.3	17.1	N, NE	608.4	2.2	Ci.	Cu.	● a.
27	60.13	25.9	30	21.9	72	17.8	NE	443.3	4.7	Ci., Ci.-S.	Cu., Cu.-N.	● a.
28	60.08	26.8	30.7	22.5	71	18.2	N, NE	446.8	5	Ci., Ci.-S.	Cu.	● a.
29	59.59	27.5	31.8	24.3	65	17.4	N	536.2	2.3	Ci.	Cu.	● a.
30	59.83	26.8	31	23.1	66.3	16.9	N, NE	562.5	4.8	Ci., Ci.-S.	Cu.	● a.
31	59.57	27	31.7	23.4	66	16.9	NE	375.4	5	Ci.	Cu.	● a.
Mean	758.68	26.9	31.3	23.3	71.1	18.4		456.1	4.4			
Total												23.9

<sup>a</sup> 28 days of observation.

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied,  $-1.88$  mm.]

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 2.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.	0-12.	0-10.					mm.		
1.	760.71	25.3	29.2	23	86.2	20.6	NW quad.	0.8	7.8	Cl.-S.		N. Cu.-N.	NE	3.6	● a. d p.
2.	60.33	26.1	31.6	22	78.7	19.3	Variable	1.3	4.3	Cl.-S.	SW	Cu. NE	ENE		Ω <sup>2</sup> a.
3.	59.80	25.9	30.5	22	86	21.3	SE	1.7	3.2	Cl.-S.		Cu. NE	ENE		Ω <sup>2</sup> a.
4.	59.66	26.6	31.4	22	6.9	20.2	SSE	1.7	4.7	Cl.-S.	SW	Cu. ENE	ENE		Ω <sup>2</sup> a.
5.	59.16	26.5	30.8	22	6.0	20.6	Variable	1.7	4.3	Cl.-S.	SW	Cu. ENE	ENE		Ω <sup>2</sup> a.
6.	59.22	27	32	23	78.5	20.5	Variable	1.8	3.5	Cl.-S.		Cu. ENE	ENE		Ω <sup>2</sup> a.
7.	58.94	24.9	27	23	6.9	20.1	NW	1.5	7.5	Cl.-S.	SW	Cu. ENE	ENE	16.2	Ω <sup>2</sup> a. ● a. p.
8.	57.91	26.4	30.7	23	1	83.5	Variable	1.8	6.7	Cl.-S.	SW	N. Cu.-N.	NE		Ω <sup>2</sup> a.
9.	57.78	26.8	31.4	23	7	79.8	E quad.	1.5	5.8	Cl.-S.		Cu. NE	NE	3.3	● a.
10.	58.78	27.3	32.8	23	5	79	SE quad.	1.5	5	Cl.-S.	W	Cu. ENE	ENE		Ω <sup>2</sup> a.
11.	59.37	26.8	31.5	23	3	77.3	NNW, SSE	1.5	4.2	Cl.-S.	W	Cu. ENE	ENE	2	● a.
12.	58.89	27.2	31.8	23	3	80.5	S quad.	1.7	3	Cl.-S.	W	Cu. ENE	ENE		Ω <sup>2</sup> a.
13.	58.70	28	33	24	77	21.4	SE quad.	1.5	3	Cl.-S.	WSW	S.-Cu.		.6	Ω <sup>2</sup> a.
14.	59.38	27.4	33	24	6	80.8	Variable	1.5	4.8	Cl.-S.		Cu. NE	NE	4	● ↑ p.
15.	59.79	27.4	32.8	24	4	74.8	NE	1.7	4.5	Cl.-S.		Cu. NE	NE		Ω <sup>2</sup> a.
16.	59.38	28.1	33.4	24	69.8	19.4	ESE, NE	1.7	4.7	Cl.-S.		Cu. ENE	ENE		Ω <sup>2</sup> a.
17.	59.45	27.6	32.4	23	7	75	SSE	1.7	3.7	Cl.-S.	SW	Cu. ENE	ENE		Ω <sup>2</sup> a.
18.	59.38	27.6	32.9	23	4	73.5	Variable	1.8	5	Cl.-S.		Cu. ENE	ENE		Ω <sup>2</sup> a.
19.	59.29	27.6	33	23	8	72.3	ENE	1.8	5.8	Cl.-S.		Cu. ENE	ENE		Ω <sup>2</sup> a.
20.	59.50	27.8	32.3	23	8	70.6	SSE	1.8	5.5	Cl.-S.		Cu. ENE	ENE		Ω <sup>2</sup> a.
21.	59	26.9	32	22	2	73.8	ESE	1.7	2.8	Cl.-S.	SW	Cu. E, ENE	ENE		Ω <sup>2</sup> a.
22.	58.49	26.5	33.4	22	6	78.7	N. SSE	1.8	6	Cl.-S.		S.-Cu., Cu.			Ω <sup>2</sup> a.
23.	58.65	27	32.2	22	4	78	SSE	1.7	2.3	Cl.-S.		Cu. ENE	ENE	16.2	Ω <sup>2</sup> a. ● ↑ p.
24.	59.90	27.6	31.8	24	71.7	19.4	E quad.	1	2.3	Cl.-S.		Cu. ENE	ENE		Ω <sup>2</sup> a.
25.	60.45	27.5	32.5	23	9	73.7	E quad.	1.2	4.2	Cl.-S.		Cu. E	E		Ω <sup>2</sup> a.
26.	60.40	27.4	33	23	66.5	17.6	ENE	1.5	2.2	Cl.-S.		Cu. E	E		Ω <sup>2</sup> a.
27.	60.60	26.4	31.3	22	4	76.8	Variable	1	6.5	Variable		Cu. NE	NE	.5	Ω <sup>2</sup> a.
28.	60.80	26.7	31.5	23	3	79	SE quad.	1	6.3	Cl.-S.	SW	Cu. ENE	ENE	9.1	Ω <sup>2</sup> a. ● a. p.
29.	60.72	27.6	32.6	24	74	20	Variable	.8	3.8	Cl.-S. Ci.		Cu. ENE	ENE	1.8	Ω <sup>2</sup> a. ● a. d p.
30.	60.70	27.1	32.7	22	4	73	E quad.	.8	3.7	Cl.-S.	SW	Cu. E	E	1.5	Ω <sup>2</sup> a.
31.	60.28	27.3	33.6	22	6	74.7	SE quad.	.7	5	Cl.-S.	W	Cu. E	E		Ω <sup>2</sup> a.
Mean	759.54	27	31.9	23.3	77.2	20.2		.7	4.6						
Total														57.7	

## Meteorological data for first and second class stations—Continued.

## CAPIZ.

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied, -1.81 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	760.54	26.2	31	23.6	85.2	21.5	NE quad.	158.3	7.2	Ci.-S.	Cu., N.	E
2.	60.24	24.9	29	23.5	91	21.2	NE	239.4	6.2	Ci.-S.	N.	NE
3.	59.60	26.6	30.4	24	79.8	20.7	NE	204.5	5.7	Ci., Ci.-S.	N.	NE
4.	59.37	26.4	31.7	24	82.2	21	ENE	236.3	5.5	Ci.	Cu.	ENE
5.	58.95	26.6	31.7	23.4	78.3	20.1	ENE	208.8	3	Ci.	Cu.	NE, ENE
6.	58.88	27	31.7	24.6	83.3	22	ENE	187.1	5	Ci.	Fr.-N., N.-cf.	E
7.	58.47	27	32.7	24.2	82.7	21.7	ENE, E	178.2	5.2	Ci.-S.	Cu.	E
8.	57.62	26.6	31.9	23.2	86.3	22.1	NE	92	4	Ci.	Cu., Cu.-N.	E
9.	57.11	27.5	32.4	25	82.5	22.2	NE quad.	167.8	4.5	Ci.	Fr.-Cu.	E
10.	58.25	27.4	32.3	24.9	79.3	21.2	E	214.9	3.3	Ci.	N.	E
11.	58.76	26.6	32.2	23.8	83.3	21.2	NE quad.	165.3	3	Ci.	Cu.	E
12.	58.48	26.6	32.2	23.3	83.5	21.4	NE	111.2	2.3	Ci.	Cu.	E
13.	58.50	26.2	32.6	22.5	84.2	21.1	NE	102.9	2.7	Ci.	Cu.	NE
14.	59.11	26.6	32.3	22.8	83.5	21.3	NE quad.	109.1	4.3	Ci.	Cu.	NE, ENE
15.	59.47	26.7	32.8	23.2	79.8	20.6	E	252.7	2.8	Ci.	Cu.	E
16.	59.29	27.1	32.5	23.8	75.7	20	NE quad.	228.5	3.7	Ci.	Cu.	NE
17.	58.96	27.2	32.7	24.5	78.2	20.8	E	236.5	6.7	Ci.	Fr.-N.	E
18.	59.08	27.2	32.6	24.2	74.8	19.7	E	197.4	4	Ci.	Variable	E
19.	58.81	27.1	31.6	24.7	78.7	20.9	ENE	240.2	5.7	Ci.-S.	Fr.-N.	E
20.	59.27	26.6	32.1	24.3	79.3	20.4	NE	168.7	5.7	Ci.	Fr.-N., N.	NE
21.	58.59	26.3	32.6	22	75.3	18.8	ENE	155.7	5	Ci.	Cu.	ENE
22.	58.52	25.1	32.2	20	82.2	19.3	NE	118.6	3.5	Ci.	Cu.	E
23.	58.24	26.4	32.7	22.8	79.5	19.9	E	178.6	3.8	Ci.	Fr.-Cu.	E
24.	59.60	26.2	33	22.9	79.3	19.8	E	167.6	2.7	Ci.	Fr.-N., Fr.-Cu.	E
25.	60.23	26.2	32.8	22.3	79.3	19.9	NE quad.	187.5	3.2	Ci.	Cu.	E
26.	59.96	27	32.8	25.1	75.8	20	ENE	280.8	4.7	Ci.-S.	Variable	E
27.	60.50	26.2	32.8	21.8	79.3	19.9	E	156	3.2	Ci., Ci.-S.	Cu.	E
28.	60.63	26	31.9	21.9	81.7	20.2	NE	151.6	6.8	Ci.	Cu.	E
29.	60.32	26.6	32.3	24.3	80.5	20.5	E	213.5	3.2	Ci.	Variable E, ENE	E
30.	60.44	26.8	32.8	24	74.3	19.3	E	264.4	3.2	Ci.	N.	E
31.	59.99	27.1	32.8	25	75.2	19.8	E	217	4.8	Ci.	Cu.	E
Mean	759.22	26.6	32.1	23.5	80.5	20.6		186.8	4.3			
Total								5,791.1				5.6

## CALBAYOG.

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied, -1.80 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	760.53	25.9	32.9	21.6	84.7	20.9	NE	144.9	5.5	Ci.-S.	S.-Cu.	NE
2.	60.20	26.9	33.1	21	82.2	20.1	NE	169.1	2		S.-Cu.	NE
3.	59.60	25.4	30.9	21.3	89.8	21.5	Variable	124	4.3	Ci.-S.	S.-Cu.	ENE
4.	59.42	26.1	32.8	21.2	82.5	20.5	E quad.	156.8	5	Ci.-S.	S.-Cu.	E
5.	59.18	26	31.2	22.1	85.7	21.2	NE	154.7	4.7	Ci., Ci.-S.	S.-Cu.	E
6.	59.05	25.8	31.2	22.3	87	21.4	NNE	134.8	6	Ci.-S.	S.-Cu.	E
7.	58.87	24.6	29.7	21.7	92.8	21.3	SSW	132.8	6.7	Ci.-S.	S.-Cu.	ENE, E
8.	57.74	26	31.5	22.1	87.5	21.8	Variable	143.9	4.7	Ci.	S.-Cu.	E
9.	57.48	25.9	30.2	22.4	87.3	21.7	Variable	116.3	5	Ci.-S.	S.-Cu.	E
10.	58.65	24.8	30.1	20.7	87.3	20.2	Variable	148.4	4.8	Ci.-S.	S.-Cu.	ENE
11.	58.93	25.2	30.7	21.7	89	21.1	Variable	134.5	5	Ci.-S.	S.-Cu.	ENE
12.	58.65	25.7	31.9	21.1	87	21.3	N quad.	155.9	3	Ci.-S.	S.-Cu.	ENE, ESE
13.	58.40	26.2	32.2	21.9	86.8	21.8	N quad.	157.1	1.2	Ci.	Cu.	ENE
14.	59.22	26.8	33.6	22.2	84.5	21.8	N quad.	148	4.3	Ci.-S.	S.-Cu., Cu.	NE
15.	59.65	26.5	33.9	21.4	82.3	20.8	ENE	208.3	1.8		Cu.	NE
16.	59.22	26.8	34	22.4	82.7	21.3	N	189.2	1.3	Ci.	Cu.	NE
17.	59.26	26.5	34.4	22	84.8	21.6	NE quad.	156.5	2.8	Ci.	Cu.	NE
18.	59.36	26.2	33.8	21.6	82.2	20.3	Variable	157.2	2.7	Ci.	Cu.	ENE, E
19.	59.03	27	33.9	22.5	75.3	19.2	E quad.	214.1	1.5		Cu.	ENE, E
20.	59.79	25.5	32.5	20.8	81.2	19.2	N	157.8	3.2	Ci.	S.-Cu.	E
21.	58.80	25	30.6	19.3	81.8	18.9	Variable	167.2	.3	Ci.	Cu.	E
22.	58.39	26	33.5	19.8	80	19.6	Variable	154.1	1.8	Ci., Ci.-S.	S.-Cu.	E
23.	58.45	25.9	33.7	20.5	80.5	19.5	NE quad.	154.1	.5		Cu., S.-Cu.	E
24.	59.79	25.5	33.1	20.1	79	18.7	N	158.9	.3		Cu.	E
25.	60.27	26.6	35.6	21	77	19.1	ENE	189	2	Ci.	Cu.	E
26.	60.32	26.3	35.2	20.8	71.7	17.1	ENE	195.2	1.7	Ci.	Cu.	ENE, E
27.	60.42	26	34.9	19.6	75.7	18.2	Variable	179.4	3.2	Ci.	S.-Cu.	ENE, E
28.	60.59	25.8	33.5	21.3	85.3	20.8	N	141.1	6.2	Ci.-S.	S.-Cu.	E
29.	60.52	25.6	33.2	20.9	82.8	19.9	Variable	169.4	3.3	Ci.	S.-Cu.	E
30.	60.49	26	33.3	20.1	78.5	19.2	NE quad.	161.1	2.8	Ci.	S.-cf.	ENE, E
31.	60.13	25.7	31.4	20.9	80	19.4	Variable	150.2	2.5	Ci.	S.-cf., Fr.-Cu.	ENE
Mean	759.37	25.9	32.7	21.2	83.1	20.3		158.7	3.2			
Total								4,919				63.4

**LEGASPI.**

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
1.	761.04	27	32.1	22.7	77.8	20.5	NE, NNE	297.6	5.5	Ci.	E	Cu.	ENE	2.8	●° p.
2.	60.64	28.8	28.6	22.7	79.2	19.4	NE	423.7	8.2	Ci.-S.		N.	NE	5.8	● a. p.
3.	60.02	28.1	31	21.5	80.7	20	ENE	220	3.3	Ci.		Cu.	E		● a.
4.	59.97	28.3	30.7	23.2	78.7	20.5	NEquad.	269.3	3.8	Ci.		Fr.-N.	ENE	4.2	d ● a.
5.	59.79	28.3	30.9	23.1	82.2	20.3	NE	253.9	6	Ci.-S.		Cu.	ENE	8.1	●° a. p.
6.	59.64	28.3	30.5	23.1	81	21.2	NE	294	5.7	Ci.-S.		Cu.-N.	E	15	● a. p.
7.	59.02	28.1	30.5	22.3	86.8	22.1	NE	200.6	6.8	Ci.-S.		N., Cu.-N.	E	22.9	● a. p.
8.	57.98	27	31.5	22.6	84.3	21.7	NE	151.1	7.5	Ci.-S.		N., Cu.		2	● a.
9.	57.69	27.6	31.1	23.4	81	22.1	ENE	246.3	6	Ci.		Cu.	ENE	3.3	● a. ●° p.
10.	58.91	27.6	32	23.5	77	21	ENE	248.5	4.2	Ci.	E	Cu.-N.	E		
11.	59.45	27.1	31.4	23.1	79.8	21	NE	232.1	5.8	Ci.-S.		Cu.-N.	ENE	2.3	● d p.
12.	58.90	26.7	31.7	20.9	80.8	20.8	ENE	144.2	1.2	Ci.		Cu.			
13.	58.68	26.8	32.6	20.4	80.8	20.8	NEquad.	146.5	2	Ci.-S.		Cu.			
14.	59.50	27.2	32.6	20.9	79.5	21.1	NEquad.	205.2	3	Ci.		Cu.	E		
15.	59.94	27.7	31.8	23.6	75.2	20.6	NE	344.1	3.3	Ci.		Cu.	ENE		
16.	59.72	28	32.6	24.5	69.2	19.3	ENE	319.2	2.7	Ci.		Cu.	ENE		
17.	59.71	27.6	32.4	22.6	76.3	20.9	ENE	264.5	3	Ci.		Cu.	E	.3	●° p.
18.	59.69	27.4	31.2	23.4	77.3	20.8	NEquad.	272.4	3.3	Ci.	NE	Cu.-N.	ENE	1.8	● a.
19.	59.60	27.6	31.9	23.5	72.7	19.8	NE, NNE	317.3	4	Ci., Ci.-S.		Cu., Fr.-Cu.	ENE	.5	
20.	60.08	27.8	32	23.5	71.5	19.7	NEquad.	246.8	3.2	Ci.	W	Cu.-N.	E		●° a.
21.	58.89	26.7	32.2	20.3	72.7	18.6	NE	156.2	.7	Ci.		Cu.	ENE		
22.	58.56	26.3	32.8	18.7	76	19	E	151.4	1	Ci.		Cu.			
23.	58.74	26.4	32.3	20.5	77.7	19.5	E	202.6	.8	Ci.		Cu.	ENE		
24.	60.07	26.8	32	18.6	75.2	19.5	NE	197.9	2.5	Ci.		Cu.-N.	E		
25.	60.90	25.5	32.5	17.7	77	18.4	ENE	202.3	1	Ci.		Cu.	E		
26.	60.54	27.4	32	23.4	72.8	19.7	NEquad.	364	4.8	Ci.-S.		Cu.-N.	E		d° a. p.
27.	60.99	26.1	32.2	18.6	76.2	19.1	ENE	219.2	1.5	Ci., Ci.-S.		Cu.	E		d° a.
28.	61.14	26.2	31.8	21.4	81	20.5	NEquad.	240.3	3.7	Ci., Ci.-S.		Cu.	NE	4.1	d° a.
29.	60.95	27.5	32.1	22.4	77	20.8	NE, NNE	238.3	3.7	Ci.-S.		Cu.	E	2.3	● a.
30.	61.03	27.3	32	23.1	75.8	20.4	NE, ENE	294.8	3.5	Ci.		Cu.-N.	ENE	7.1	●° a. p.
31.	60.61	27	31.4	22.3	80.2	21.1	NE	266.6	6	Ci.	W	Cu.-N.	E	9.4	● a.
Mean	759.75	26.9	31.7	21.9	77.9	20.3		246.2	3.8						
Total								7,630.9						91.9	

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. of.	mm.		Km.	0-10.				mm.		
1.	761.61	24.6	26.8	23.4	87.2	20	NE, N.	571.6	9	A.-Cu.	NE	S.-Cu.	NE	4.4	● d a. p.
2.	61.26	25.9	27.7	24.7	76.7	19.1	NE	923.7	6.5	A.-Cu.	NE, E	S.-Cu.	NE		d° a.
3.	60.36	25.1	26.9	23.9	82.5	20.9	N	825.3	9	A.-Cu.	NE	N.	NE	22.9	● a. p.
4.	60.97	24.9	27.6	23.2	87.2	20.4	N	431.2	9.3	Cl.-S.		S.-Cu.	NE		d° a. p.
5.	59.97	24.9	29.2	21.6	87.7	20.5	NW	300.1	7	Cl.	S	S.-Cu.	NE, N	2.3	● a. p.
6.	59.71	26.4	30	24.5	84.5	21.5	NE, NW	376.9	6.7	A.-Cu.	NE	S.-Cu.	NE	4.8	● a. p.
7.	59.10	25.5	28.6	22.3	86	20.8	Variable	166	7.5	A.-Cu.	NE	S.-Cu.	NE	21.4	d° a. p. ● < p.
8.	58.14	25.4	28.8	21.7	89.7	21.5	NE, NW	235.3	7.5	A.-Cu.	NE	S.-Cu.	NE	.3	● d° a.
9.	57.59	27	30	24.9	85	22.4	NE, N	260.8	9	Cl.-S.	SE	S.-Cu.	NE		
10.	58.69	27.4	30.8	24.7	82.7	22.8	NE, N	285.3	6.2	Cl.-S.	SE	S.-Cu.	NE, E		
11.	59.40	27.2	31.3	22.8	77.5	20.8	N	336.7	3.2	Cl.	SE	S.-Cu.	NE		
12.	58.84	26.1	28.5	23.3	86.3	21.7	NW quad.	308.9	5.5	A.-Cu.	NE	S.-Cu.	NE, N	.3	d° a
13.	58.79	26.9	29.7	22	82.8	20.5	NW quad.	284.6	4.2	A.-Cu.	NE	S.-Cu.	NE		d° a.
14.	59.62	26.5	30	21.9	82.8	21.2	NE	419.9	4.5	Cl.	SE	S.-Cu., Cu.	NE		○° a. p. ☐° p.
15.	59.87	27.6	30.7	25.5	77.6	21.3	E	356.4	3.7	A.-Cu.	E	Cu.	NE		☐° p.
16.	59.63	27.1	31.1	25.5	74.8	19.9	NE, N	266.7	2.7	Cl.	SE	Cu.	NE, E		☐° p.
17.	59.56	25.8	30.2	21	80.8	19.9	Variable	237	4.3	A.-Cu.	SE	Cu.	NE		☐° p.
18.	59.26	26.6	31.5	22	82	21.1	NE quad.	257.7	3.5	Cl.	SE	Cu.	E		☐° p.
19.	59.12	26.7	31.3	22.6	80.7	20.8	Variable	282	2.8	Cl.	SE	Cu.	NE		☐° p.
20.	59.94	26.8	32	22.9	79.2	20.5	NE, SW	215.5	5	Cl.	SE	Cu.	E, SE		☐° p.
21.	58.58	25.9	29.9	21.9	81.3	20.4	NW		1.7	Cl.	SW	Cu.	E		☐° a. ☐° p.
22.	58.45	25.7	29.9	20.6	82.5	19.4	SW, NNE		5.8	Cl.	SSE	Cu.	NE, SE		☐° a. ☐° p.
23.	58.50	25.7	31.5	20.6	80.5	19.5	SW	261.7	5.3	A.-Cu.	NE	Cu.	NE		☐° a. ☐° p.
24.	59.99	25.4	30.4	23.7	81	19.2	NE	380	1.3	Cl.	NE	Cu.	NE		☐° a. ☐° p.
25.	60.67	26.2	32	20	76.7	19.2	NE	364.7	2.7	A.-Cu.	NE	Cu.	NE		☐° a. ☐° p.
26.	60.48	26.9	32.1	20.5	74.2	19	NE		3.3	A.-Cu.	NE	Cu.	NE		☐° a. ☐° p.
27.	61	26.7	31.8	21.9	75.3	19.4	N quad.	313.5?	1.7	Cl.		S.-Cu.	NE		☐° a.
28.	61.04	27.4	31.3	22	77.5	20.8	NE	366	4.8	A.-Cu.	E	Cu.	NE		☐° a.
29.	61	27.1	30.4	24.7	78.3	20.8	NE	435.5	7.2	Cl.-S.	E	S.-Cu.	NE		☐° a.
30.	60.97	27.9	32.1	25.8	75	20.8	NE	455.6	3.7	A.-Cu.	E	Cu.	NE, E		
31.	60.60	27	30.8	25.2	80.7	21.4	NE	285.3	7.3	A.-Cu.	NE, E	S.-Cu.	E		d° a.
Mean	759.74	26.3	30.2	22.9	81.5	20.5		364.6	5.2						
Total														57.4	

## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5<sup>a</sup> meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1..	761	26	30	22.4	74.5	18.4	ENE	3	8.2	Ci.-S.	Cu.-N. E		
2..	60.67	26.6	31.4	23.6	66.7	17.1	ENE	2.8	4.2	Ci.	S.-Cu. ESE		
3..	59.77	26.8	33	20.9	70.3	18.2	ENE	2.3	4.8	Ci., Ci.-S.	Cu. E		
4..	59.78	26.3	31.3	23.3	72.7	18.4	ENE, E	3	7.3	Ci.-S.	Variable E	0.5	d p.
5..	59.48	26.5	32.4	23.4	74	18.9	E	1.7	6.8	Ci.-S.	Cu. SE, ESE		
6..	59.17	26.7	32.5	22.6	75.2	19.3	E quad.	2.2	7	Ci.-S.	S.-Cu. SE		
7..	58.67	25.8	32	22	82.8	20.3	ENE, E	1.3	7.3	Ci.-S.	Cu. SE	2.8	⊕ p.
8..	57.48	26.2	33.2	20.5	75.8	18.9	E	1.5	5	Ci.-S.	Cu. SE, ESE		● p.
9..	57.09	26.9	33.1	21.6	76.2	19.6	E	1.3	6	Ci.-S.	Cu. SE		⊕ a.
10..	58.11	27.9	34.2	22.7	72.8	19.9	ENE	2.3	5.2	Ci.-S.	Cu. E		⊕ a.
11..	58.75	26.9	33.6	21.9	71.5	18.5	ENE	1.3	4.2	Ci.-S.	Cu. SE quad.		⊕ a.
12..	58.31	27.3	33.6	20.8	75	20.1	Variable	.8	5.8	Ci.-S.	S.-Cu. SE		⊕ a.
13..	58.14	27.6	36	22.5	74.8	19.9	E	1	5.8	Ci.-S.	S.-Cu. E, ESE	4.6	● p.
14..	59.05	27.4	33.6	22.1	74.8	20	NE	1	5	Ci.-S.	Cu. SE		
15..	59.25	26.9	33.4	20.4	72.2	18.6	ENE, E	2	5.5	Ci.-S.	Cu. SE		⊕ a.
16..	58.94	27.3	33.7	21.2	64	17	ENE	1.3	4.3	Ci., Ci.-S.	Cu. SE		
17..	59	27.1	33.8	20.8	67	17.4	E quad.	1.8	5.3	Ci.-S.	Cu. SE		⊕ a.
18..	58.78	27.5	34.6	22.1	71.5	19.2	E quad.	1.7	5.7	Ci.-S.	Cu.-N., s.-cu. SE		
19..	58.72	27.8	34.4	23.2	68	18.5	NE quad.	2.2	4	Ci.-S.	Cu. SE		⊕ a.
20..	59.30	27.7	34.4	22.5	68.7	18.5	NE quad.	2	5	Ci.-S.	Cu., S.-Cu. SE		⊕ a.
21..	58	26.3	34	19.5	72.2	17.9	E quad.	1.5	3.2	Ci.	Cu. SE		⊕ a.
22..	57.96	26.3	33.5	20	72	17.9	E quad.	1.2	6.8	Ci.-S.	S.-Cu. SE		⊕ a.
23..	57.94	26.2	33.5	19.9	70.7	17.4	ENE	1.7	6.2	Ci.-S.	Cu. SE		⊕ a.
24..	59.48	27.1	35.1	21	72.3	18.8	E, SW	1	4.5	Ci.-S.	S.-Cu. SE		⊕ a.
25..	60.26	27.4	34.5	21	66	16.9	E	1.8	3.8	Ci.	Cu. E		⊕ a.
26..	60.11	27	34.4	20.8	66.3	17.1	E	1.8	4	Ci.	S.-Cu. ESE		⊕ a.
27..	60.44	27	34.6	21.2	67	17.3	ENE	1.8	4.5	Ci.-S.	Cu. E, ESE		⊕ p.
28..	60.64	26.8	34.5	20.1	67.7	17	ENE	1.8	5.3	Ci.-S.	Cu. SE		
29..	60.44	27.8	33.8	22	67.5	18.5	E	2.5	6.8	Ci.-S.	S.-Cu. E		
30..	60.40	28	33.5	24.6	64.8	17.9	E quad.	2.5	6.2	Ci.-S.	S.-Cu. SE quad.		
31..	60.08	27.3	32.2	22.5	71.3	19	E quad.	2	8.2	Ci.-S.	S.-Cu. E		
Mean	759.20	27	33.5	21.7	71.2	18.5		1.8	5.5				
Total												7.9	

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1..	761.76	25.6	29	23.3	83.5	20.4	NE	333.3	10	Ci.-S.	Cu.	NE, E	11.2	● a. p.	
2..	61.76	26.4	29	24.6	76.7	19.5	NE	485	8.7	Ci.-S.	Cu.	NE	.8	● a.	
3..	60.30	25.8	30	22.2	84.5	20.8	NE	208.3	8.2	Ci.-S.	Cu.	NE	7.1	● a. p.	
4..	60.70	24.6	29.2	22.2	89.8	20.6	NE	216.7	8.3	Ci.-S.	Cu., S.-Cu.	NE	14	● a. p.	
5..	60.33	24.8	30.1	22	88.5	20.4	ENE	163.3	8.7	Ci.-S.	Cu.	E	22.9	⊕ a. ● p.	
6..	60.19	25.5	30.6	22.8	88	21.3	E quad.	217.1	9.3	Ci.-S.	Cu.	E	5.5	● a. p. p.	
7..	59.28	26.3	30.8	23.5	85.8	21.6	E	130.9	7.7	Ci.-S.	Cu.	E	6.1	● a. p.	
8..	58.38	26.2	30.2	23.8	90	22.6	NE	139.4	7.5	Ci.-S.	Cu.	NE	3.8	⊕ d a. ● p.	
9..	57.79	26.5	30.8	22.1	86.3	22.2	ENE	183.7	4.8	Ci.	Cu.	E		⊕ a.	
10..	59.16	26.8	31.3	23	83.8	21.8	ENE	190.8	6.2	Ci.	Cu.	E		⊕ a.	
11..	59.74	26.3	30.1	22.7	84	21.2	ENE	186.5	4.7	Ci.	Cu.	E	4.8	⊕ a. ● d° p.	
12..	59.16	26.5	31.3	23.4	87	22.2	E, NE	103.5	6.7	Ci.-S.	Cu.	E		● a.	
13..	59.08	26	31.6	22.2	87.2	21.6	NE	125.7	1.3	Ci.	Cu.	E, NE		⊕ a.	
14..	60.02	26.1	31.7	21.4	84	20.8	ENE	155.7	1.3	Ci.	Cu.	E, ENE		⊕ a. p.	
15..	60.49	26.1	31.1	22.4	82.3	20.5	ENE	314.3	6.7	Ci., Ci.-S.	Cu.	ENE	.8	⊕ a. ● p.	
16..	60.14	27.5	31.5	23.7	71.7	19.4	E, ENE	271.1	4.2	Ci.	Cu.	E, ENE		⊕ p.	
17..	59.94	26.3	31.3	21.1	80.8	20.2	E	174.9	3.5	Ci.	Cu.	E		⊕ a.	
18..	59.89	26.8	31	22.8	81.8	21.2	E	225.7	4.8	Ci.	Cu.	E		⊕ a.	
19..	59.81	26.9	31.2	23.6	80.2	20.9	NE	233.8	3.3	Ci.	Cu.	E		⊕ a.	
20..	60.31	26.4	31.6	22.2	80.7	20.3	ESE	181.5	2.3	Ci.	Cu.	ESE		⊕ a.	
21..	58.82	25.7	31.3	20.8	79.8	19.2	NE	125.8	.3	Ci.	Cu.	E		⊕ a.	
22..	58.83	25.4	31.3	20.8	81.8	19.4	NE	106.4	1.3	Ci.	Cu.	E		⊕ a.	
23..	58.80	25.3	31.3	20.1	81.2	19.2	E	158.9	1.7	Ci.	Cu.	E		⊕ a. p.	
24..	60.34	26	32	20.6	80.8	19.9	NE	151.3	.2	Ci.	Cu.	E		⊕ a.	
25..	61.12	25.7	31.3	20.5	80	19.3	E	142.8	1.5	Ci.	Cu.	E		⊕ a.	
26..	60.95	26	31	20.5	79.7	19.6	E	236.8	3.3	Ci.	Cu.	E		⊕ a.	
27..	61.36	26.4	31.7	21.2	76.8	19.3	E	174.4	.3	Ci.	Cu.	E		⊕ a.	
28..	61.58	26.1	31.8	21	81.8	20.3	NE	215.4	4.7	Ci.	Cu.	E	17.8	● a. ● d° p.	
29..	61.46	25.6	29.2	23	86.3	21	NE	170.2	7.2	Ci.-S.	Cu.	E	7.4	● a.	
30..	61.46	27.4	31.2	24	76.3	20.6	E	279.6	6.2	Ci.	Cu.	E	5.6	⊕ a.	
31..	60.94	26.3	30.6	23.4	85.3	21.4	Variable	159.9	8.5	Ci.-S.	Cu., N.	E	8.3	● a. d° p.	
Mean	760.13	26.1	30.8	22.3	82.8	20.6		198.8	4.9						
Total								6,162.7					116.1		

<sup>a</sup> This is an approximate height of the barometer above sea level.

## Meteorological data for first and second class stations—Continued.

## SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied,  $-1.69$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	761.44	26.2	33	20.5	74.2	18.2	E	2.5	3	A.-Cu.	E	Cu.	NE	☉ ☉ a.
2.	61.21	26.5	35	21	67.8	16.7	E	2.5	1.2	Ci.		Cu.	E	☉ a.
3.	60.54	26.4	34.1	19.9	70.8	17.6	NE	2.2	4.8	A.-Cu.	ENE	Cu.	E	☉ a.
4.	60.43	26.8	32.5	22.5	70	18	E, N	2.5	7.2	A.-Cu.	E	Cu.-N.	E	0.8
5.	60.20	26.9	34	22.3	76	19.4	N, NE	1.7	5.7	Ci.	E	Cu.-N.	ENE	d a.
6.	60.11	26.4	32	21.4	73.8	18.6	E, N	2	4.3	Ci.	SE	Cu.	ENE	☉ ☉ a.
7.	59.22	27	34.5	20.9	73.5	19	E	1.8	5.3	Ci.	SE	Cu.	E	b ☉ a.
8.	58.10	27.4	35.6	21.5	75.3	19.9	NE	2	4.7	A.-Cu.	SE	Cu.	NE	b ☉ a.
9.	57.47	27.9	35.6	21.2	73.5	20	NE	1.5	5.2	Ci.	SE	Cu.	E	b ☉ a.
10.	58.64	27.7	35.2	22.3	70.2	19	NE	2.2	3.3	A.-Cu.	ESE	Cu.	E	b ☉ a.
11.	59.16	27.3	35.2	20.6	72.5	19	NE, N	2.5	2.2	A.-Cu.	E	Cu.	ENE	☉ ☉ a.
12.	58.77	28.2	36.6	20.4	69.8	18.9	N	1.8	1.7	A.-Cu., Ci.		Cu.	E	b ☉ a.
13.	58.74	28.2	36.9	21.6	73	19.9	N quad.	2.3	4.2	Ci.		Cu.	E, SSE	☉ ☉ a.
14.	59.53	28.2	36	22.6	69.3	19.2	NE	2.5	3	A.-Cu.		Cu.	NW	☉ ☉ a.
15.	59.90	27.5	34	21.6	71	18.9	ENE	3.2	3.5	Ci.		Cu.	E	☉ a.
16.	59.46	26.9	34.1	20.7	69.2	17.6	E	2	2	A.-Cu.		Cu.	E	b a.
17.	59.56	26.3	35.1	18.4	69.2	16.6	E	2.3	1.5	Ci.		Cu.	E	☉ a.
18.	59.30	27.2	35.5	18.8	68.5	17.6	E, N	2.7	2.2	Ci.	SSW	Cu.	E	☉ a.
19.	59.39	26.7	33.6	20	70.2	17.7	E	3	2.3	A.-Cu.	ENE	Cu.	E	☉ a.
20.	59.82	27	35	19.4	69	17.7	E	2.5	2.5	Ci.		Cu.	E	b a.
21.	58.35	27.6	37.4	19	64.8	16.5	NE, N	1.8	1.2	A.-Cu., Ci.		Cu.		b a.
22.	58.32	27.8	36	21.3	69.5	18.5	NE	1.8	5.2	Ci.		Cu.	E quad.	☉ a.
23.	58.31	27.6	35.4	20.8	70.3	18.6	N	1.8	2	Ci.		Cu.	ENE	☉ a.
24.	59.94	28.2	37.1	20.4	67.5	18.3	N	2	3.7	A.-Cu.		Cu.	E, ESE	b a.
25.	60.56	28.4	36.4	23.2	68.2	18.9	NE, SE	2	5.5	A.-Cu., Ci.		Cu.	NE	b a.
26.	60.81	26.7	32.4	22.8	72.2	18.4	E, N	2.7	5	A.-Cu.	ENE	Cu.	NE	d a.
27.	61.26	25.8	32	20.7	72.3	17.6	E	2.5	5.5	Ci.		Cu.-N.	E	☉ a.
28.	61.16	27.3	37	19.5	73.3	15.9	N	2.5	2.5	Ci.	SE	Cu.	E	☉ a.
29.	60.87	27.5	36	20.2	70.2	18.4	E, N	2.8	3.5	Ci.	SE	Cu.	ENE	b a.
30.	61	27.2	34.1	22	70.8	18.5	E, N	3	2.5	A.-Cu.	ENE	Cu.	E	☉ a.
31.	60.81	27.3	34.5	20.9	69.8	18.4	E	3.3	6.7	Ci.		Cu.-N.	E	b a.
Mean	759.75	27.2	34.9	20.9	70.5	18.3			2.3	3.6				
Total													1.9	

## DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied,  $-1.67$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.			
											Upper.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	760.72	26.2	32	21	78.8	19.5	SE, NNW	229.9	1.2	Ci.			
2.	60.34	26.3	33.5	22.2	72.7	18.2	S, NW	267.5	1.2	Ci.			
3.	59.73	26.2	31.4	21	74.7	18.6	SE, NW	220.6	1.3	Ci.			
4.	59.33	27.3	34.2	23.2	70.5	18.7	SSE, NW	251.9	3.5	A.-Cu.		E	☉ a.
5.	59.52	26.5	33.3	23.5	76.7	19.4	S	237.1	7.7	A.-Cu.	NE	ENE	☉ p.
6.	59.23	27.3	32.3	22.4	80.7	21	SE, NW	208.5	5	Ci.-S.			☉ p.
7.	58.34	27.7	33.1	22.9	74.2	20.2	NW	237.2	5.7	Ci.-S.			☉ p.
8.	57.43	27.4	35.4	22.5	81.7	21.6	SE	196.1	5.3	A.-Cu.			☉ a.
9.	57.01	27.2	32.8	23.1	82.8	22.1	NW	204.6	1.8	Ci.			☉ a.
10.	57.74	28.4	36.7	24.1	77.8	22.1	Variable	202.7	3.7	Ci.			☉ p.
11.	58.26	28.7	36.8	23.5	67.3	19.2	S quad.	297.8	1.3	Ci.			☉ a.
12.	58.38	27.5	32.2	23.4	78.3	21.2	W quad.	254.2	1.3	Ci.			☉ a.
13.	58.26	27.2	31.7	23	77.5	20.7	NW	261.1	1.3	Ci.			☉ a.
14.	58.98	27.7	31.3	25	74.7	20.5	NW	265.9	1.7	Ci.			☉ a.
15.	58.70	28.4	36.3	23	68.8	19	SE	245	3.2	Ci.			☉ a.
16.	58.51	28.4	35.9	22.5	66	18.5	SE quad.	294.6	1.2	Ci.			☉ a.
17.	58.58	27.9	36.4	21.1	67.3	18	S quad.	266.2	5	Ci.			☉ a.
18.	58.66	27.2	33.5	21	70.8	18.6	NW	211.5	2.5	Ci.			☉ a.
19.	58.58	27.5	36.3	22	72.2	19.3	Variable	193.4	1.2	Ci.			☉ a.
20.	58.90	27.8	36.1	21.9	70.8	19.2	NW	197.3	1.7	Ci.			☉ a.
21.	57.84	27	34.3	20.5	73.5	19	NW quad.	225	1	Ci.			☉ a.
22.	57.81	27.6	32.9	23	76.8	20.8	NW	203.4	4.7	Ci.			☉ a.
23.	57.59	27.8	35.3	22.5	76.2	20.9	NW	211.6	2.2	Ci.			☉ a.
24.	59.40	27.9	32.3	23.1	73.3	20.1	NW	282.1	2.3	Ci., A.-Cu.			☉ a.
25.	60	27.2	31.6	23.5	76.8	20.6	NW	312.2	4.2	A.-Cu.	E		☉ a.
26.	59.69	27.7	34.1	22.5	67	18.1	S quad.	242.5	3.5				☉ a.
27.	60.23	27.1	35.8	20.2	68	17.8	Variable	228.7	2.3	A.-Cu.	E		☉ a.
28.	60.50	27.3	33.2	21.5	73.5	19.7	NW	235.1	3.7	Ci.			☉ a.
29.	60.27	27.7	33.7	21.9	75.3	20.4	NW	246.2	3.7	Ci.			☉ a.
30.	59.88	28.8	37.2	23	69.3	19.8	S quad.	235.1	2.7	Ci.			☉ a.
31.	60.04	27.7	34.8	22.4	70.3	19.2	SE quad.	219.8	4.8	Ci.			☉ a.
Mean	758.98	27.5	34.1	22.5	73.7	19.7		238.2	2.8				
Total								7,385				34.2	

## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	760.99	26.4	31	22	75.5	19	NNE	3.8	3.2	Cl.-S.	Cu.	E	-----	0 a.
2.	60.58	26.8	31.9	22.3	72.7	18.6	NNE	3	4.8	Cl.-S.	S.-Cu.		-----	0 a.
3.	60.02	26.6	32.4	21	77.2	19.6	SSE, NNE	3	4.8	A.-S.	S.-Cu.		-----	0 a.
4.	59.57	26.9	33.1	21.9	72.3	18.6	Variable	2.8	5.5	Cl.-S.	S.-Cu.		-----	
5.	59.64	27.1	32	24.1	72.8	19.3	NNE	3	9	Cl.-S.	S.-Cu.		2.3	
6.	59.50	26.9	31.5	23.6	78.8	20.6	Variable	3	10	Cl.-S.	Cu.	ESE		0 a.
7.	58.72	27.2	32	22.1	78	20.6	WNW	3	10	Cl.-S.	Cu.	NW		0 a.
8.	57.68	27.7	33.7	24.4	78	21.2	SSE	2.7	6.8	Cl.-S.	Cu.	N		0 a.
9.	57.34	27.7	32.5	24.6	78.7	21.6	NNE	3.3	9.7	Cl.-S.	Cu.	NNE		0 a.
10.	58.03	28	32.6	24.9	81.2	22.6	NNE	3	9.7	Cl.-S.	S.-Cu.		-----	
11.	58.58	27.7	33.5	22.1	74.5	20.1	WNW	2.8	7.7	Cl.-S.	Cu.	NW	-----	
12.	58.76	27.4	32.9	22.1	78.7	21.2	S, NNW	2.8	9.3	Cl.-S.	Cu.	N	0 a. p.	
13.	58.58	28	32.1	25.6	73.8	20.5	NNE	4	6.5	Cl.-S.	Cu.	NNE	-----	
14.	59.32	27.8	31.8	25.7	72.3	20	NNE	3.8	9.7	Cl.-S.	S.-Cu.	NE	-----	
15.	58.89	27.7	33.9	23.8	73.2	19.8	SSE	2.7	10	Cl.-S.	S.-Cu., Cu.		0 a. 0 a. 0 a. p.	
16.	58.72	27.7	34.8	22.1	71.8	19.4	Variable	3.2	2.3	Cl.-S., A.-S.	S.-Cu.		0 a. 0 a. p.	
17.	58.83	27.2	32.6	23	70.8	18.5	SE quad.	3.2	2.2	Cl.-S.	S.-Cu.		-----	
18.	58.91	27.4	32.9	21.4	71.2	18.9	SSE, N	3.2	9.2	Cl.-S.	S.-Cu.		-----	0 a.
19.	58.69	28	34.9	22.5	71.3	19.4	Variable	2.7	5.3	Cl.-S.	S.-Cu.		-----	0 a.
20.	59.06	27.9	34	23.5	65.8	18	SE quad.	3.3	10	Cl.	S.-Cu., Cu.		-----	
21.	58.05	27.5	32.5	22	71.2	19.2	Variable	3	6	Cl.	S.-Cu.		-----	
22.	57.97	27.8	33.5	22.4	75.2	20.6	N quad.	2.5	9.5	Cl.-S.	Cu.		-----	0 a.
23.	57.78	28	34.1	22.3	72.2	19.7	Variable	3	10	Cl.-S.	Cu.	NNW	-----	0 a.
24.	59.75	28.6	32.8	26.5	70.5	20.4	NNE, N	4.2	6	Cl.-S., A.-S.	S.-Cu.		-----	
25.	60.46	27.5	31.5	26.1	76.3	20.7	NNE	4.8	9.3	Cl.-S.	Cu.	NNE	-----	0 a.
26.	59.82	27.8	33.1	23.4	71	19.4	SE quad.	2.8	7.8	Cl.-S.	S.-Cu.		-----	
27.	60.44	28.2	34.1	23.1	61	17.1	Variable	3	6.8	Cl.-S.	S.-Cu.		-----	
28.	60.76	28	33.4	23.5	73.8	20.4	NNE	3.2	8.3	Cl.-S.	S.-Cu.		-----	
29.	60.54	28.5	32.8	26	73.8	21.2	NNE	4	10	Cl.-S.	Cu.	NNE	-----	
30.	60.08	28.6	34.5	25.1	73	20.8	Variable	3.3	9.8	Cl.-S.	S.-Cu.		-----	
31.	60.24	27.7	34.8	21.9	72.7	19.7	Variable	3	10	Cl.-S.	S.-Cu.		3	0 a.
Mean	759.24	27.6	33	23.4	73.5	19.9		3.2	7.7					
Total													5.3	

BAGUIO.<sup>a</sup>[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	638.13	16.4	22.7	13.7	86.5	12	Variable	310.1	5.3	Ci., Ci.-Cu.	Cu.	SSE	0 a. ≡ p.
2.	37.93	17.4	23.4	12.5	76	11.1	ENE, SE	386.9	5.9	Ci.	Cu.	SE, W	0 a. ≡ p.
3.	37.41	17	22.5	14.3	85.3	12.3	W quad.	222.9	8.6	Ci.	Cu.	E	1.3 d ≡ p.
4.	37.21	17.6	23.6	14.2	83.7	12.4	Variable	284.9	8.6	A.-Cu.	SE, S	E	1.5 d a ≡ d° p.
5.	37.18	16.7	20.9	15.4	92.3	13.1	E, W	196.9	9.1	A.-Cu.	SE	N.-cf.	1.3 d° a ≡ a. ● p.
6.	37.26	18	23.2	14.3	88.5	13.5	E, W	291.2	7	Ci.	S	E, SE	1 d p.
7.	36.48	17.4	22.9	15.3	90.2	13.4	Variable	256.9	7.3	Ci.	Cu.	N.-cf.	18.5 d ● p.
8.	35.93	18.6	23.9	15.7	90.3	14.3	Variable	229.5	6.7	Ci., A.-Cu. S, SE	Cu., Cu.-N.	E	d° a. p. ≡ 1/4° p.
9.	35.57	18.9	23.9	16	89.3	14.5	Variable	292.6	5.6	Ci.	Cu.	E	d° a. ≡ p.
10.	36.44	18.7	24.5	15.7	85.1	13.6	SE	271.6	7	Ci.	S	Cu.-N.	1/4° d° p.
11.	36.77	18.7	25.5	15.7	86.7	13.8	Variable	298.9	4	Ci.	Cu.	E, WSW	d° a. p.
12.	36.60	18.5	24.7	14.5	84.7	13.3	SW quad.	255.8	5.9	Ci.	S	Variable	d° a. ≡ p.
13.	36.37	18.5	25	14.8	83.5	13	W quad.	263.5	4.6			W quad.	d° a. ≡ a. p.
14.	37.01	18.2	24.3	14.8	86.3	13.3	SW	245.5	5.9	Ci.	Cu.-N.	E	d° a. ≡ p.
15.	36.91	18.3	26.3	14.5	82	12.8	E quad.	479.2	6	Ci.	Cu.	SE	0 a.
16.	36.66	18.2	26.6	14.3	76.2	11.6	E, SE	342.5	3	Ci., Ci.-S.	Cu.	SE	0 a.
17.	36.73	18.8	26.2	14.7	72.3	11.2	ENE, WSW	350.2	5.4	Ci.	S	WSW	0 a. a.
18.	36.73	17.9	25.3	14.1	78.5	11.9	Variable	352.2	2.3	Ci.	Cu.	SE	0 a. a.
19.	36.70	18.4	26.6	14.5	82.3	12.6	E	341.2	4.3	Ci., Ci.-S.	Cu.	SE	0 a. a. ≡ p.
20.	37.15	18.8	24.5	14.7	82.3	13	SE, WSW	348.2	2.4	Ci.	Cu.	SE	0 a. a. ≡ p.
21.	36.15	19	25.2	14.9	81.5	13.1	Variable	308.3	7.3	Ci.-S.	Cu.	NW	0 a. a. ≡ p.
22.	35.99	18.5	24.8	14.7	84.8	13.4	Variable	342.2	4.6	Ci.	Cu.	NW	0 a. a. ≡ p.
23.	35.99	19.2	26.2	14.6	82.2	13.3	Variable	225.3	6		Cu.-N.	E, NW	0 a. a. ≡ p.
24.	37.48	18.4	24.6	15.2	86.2	13.6	W quad.	229.7	7		Cu.	SE	0 a. a. ≡ p.
25.	37.77	17.6	23	15.5	89.5	13.4	SE, SW	191.1	6.4		N.-cf.	SE	0 a. a. ≡ p.
26.	37.48	17.4	22.8	14.8	90.3	13.2	Variable	267.8	5.4	Ci.	Cu.	Variable	0 a. a. ≡ p.
27.	38.03	18.2	24.3	14.2	87.9	13.2	Variable	349.6	5.6	Ci.	Cu.	SE	0 a. a.
28.	38.43	19.2	24.9	14.2	82.6	13.5	SE, WSW	320.9	5.1	Ci.	Cu.	E quad.	0 a. a. p.
29.	38.19	18.7	25.9	14.5	80.2	12.8	SE, WSW	334.5	4.7	Ci.	Cu.	SW	0 a. a. p.
30.	37.98	19.6	26.5	15.7	75	12.4	ENE, WSW	395	6.1	Ci.	Cu.	Variable	0 a. a. ≡ p.
31.	37.89	18.3	24.9	14.2	78	11.9	Variable	368.7		Ci.	Cu.	Variable	.3 002 a. ≡ p.
Mean	637.05	18.2	24.5	14.7	83.6	12.9		304.2	5.6				
Total								9,431.6				22.9	

<sup>a</sup>The barometric readings of this station are not reduced to sea level.<sup>b</sup>Deduced from 5 observations only.



**VIGAN.**

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	761.14	24.5	30.3	20	70.2	15.8	NNE	381.7	0.3	Ci.		Cu.	NNE	✓° p.	
2.	60.66	26.5	31.7	19.9	65.3	15.9	NNE	333.1	.8	Ci.		Cu.			
3.	60	26.9	33	22.5	67.3	17.3	NNW, N	290.8	2.2	A.-Cu.		S.-Cu., Cu.	SE		
4.	59.70	27.1	33.5	22.4	63.7	16.8	N quad.	230.2	2.7	A.-Cu.	SSW	Cu.	NE		
5.	59.55	27.9	32.1	24.1	66.2	18.3	N quad.	257.6	8.7	Ci.-S., A.-Cu.		S.-Cu., Cu.	NE	d° p.	
6.	59.49	26.9	32.7	23.1	74.3	19.5	NNW	173.4	5.5	Ci.-Cu.	NE	Cu.	NE		
7.	58.74	27	31.1	24.7	75	19.9	SSW	188.7	5	Ci.-S.		Cu.	SW	d° p.	
8.	57.62	26.5	32.3	23	80.8	20.6	N quad.	245.4	3.5	A.-Cu.	S	Cu.	NNW	d° a.	
9.	57.21	26.8	32.1	23.5	82.3	21.8	N	241.9	2	Ci.-S.		S.-Cu.	SW		
10.	57.74	27.8	33.5	22.9	80.7	21.4	N quad.	223.5	2	A.-Cu.	SW	Cu.	NW		
11.	58.63	28.3	32.9	24.6	77	21.8	NNW	151.9	5.5	A.-Cu.		S.-Cu.	NW	Δ° a.	
12.	58.79	26.8	32.7	22.8	80.2	20.7	NW quad.	256.4	2.3	Ci.		Cu.	NW		
13.	58.62	26.2	33	21.2	78.7	19.3	NNE	210.2	.3	A.-Cu.		Cu.		Δ° a.	
14.	59.21	26	32.2	21.3	80	19.6	NNE	295.3	3	A.-Cu.		Cu.			
15.	59.01	27.7	33.5	24.2	70.5	19.4	N quad.	230.9	7.2	Ci.-S.		Cu.	NNW		
16.	58.84	27.5	33.3	24.2	74.3	20.1	Variable	200	2.3	A.-Cu.		Cu.	NW		
17.	58.77	27.2	31.8	23.3	77.5	20.6	SW quad.	156.6	1.8	A.-Cu.		Cu.	SSW		
18.	59	27.3	33.2	23.2	77	20.4	Variable	162.4	6.3	Ci.-S.	SSW	S.-Cu.			
19.	58.82	27.5	33.2	23.2	77.5	20.8	WNW	197.2	3.3	A.-Cu.		Cu.	WNW		
20.	59.18	27.5	32.8	24.1	78.8	21.2	Variable	130.2	2.2	A.-Cu.		Cu.	SW		
21.	58.15	27.6	33.7	23.4	74.7	20.1	WNW	162.1	1	A.-Cu.		S.-Cu.		Δ° a.	
22.	57.98	28.1	34.3	24	76.5	21.2	NW quad.	176.8	3	Ci.-S.		Cu.	SW		
23.	57.94	27.5	33.9	22.7	72.2	19.3	N quad.	216.6	.7	Ci.		Cu.			
24.	59.87	26.8	33	21.9	73.3	19.1	N quad.	234.9	.3			Cu.	NNW		
25.	60.30	26.1	30.8	23	79.7	20	N quad.	444.8	2.2	A.-Cu.	NE	S.-Cu.		✓° p.	
26.	59.83	27.4	33.5	22.5	70.2	18.8	Variable	147.3	3.7	A.-Cu.		S.-Cu.	ESE		
27.	60.53	27.6	32.6	24.2	72.7	19.8	NW quad.	211.9	5.3	A.-Cu.	NNE	Cu.-N.	NW		
28.	60.75	27.2	33.4	24.3	79.2	21.1	NW quad.	237.1	2.7	Ci.-S., A.-Cu.		Cu.	NE		
29.	60.57	27	32.8	22.8	82.8	21.7	Variable	252	1.3			Cu.	NW	Δ ≡° a.	
30.	60.06	26.9	32.1	22.8	83.7	22	Variable	185.5	1.8	Ci.-S.		Cu.-N.	SW		
31.	60.47	27.8	32.5	24.9	77.7	21.4	Variable	188.4	5	Ci.-S.		Cu.	NW		
Mean	759.26	27.1	32.7	23	75.5	19.9		226.3	3						
Total								7,014.8					0		

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.		
1.	763	28.7	30.6	18.4	76.7	16.6	NW	1.2	3		S.-Cu., Cu.	N	Ω <sup>2</sup> a.	
2.	63.33	28.5	27	17.4	84.5	17	NE	1.2	9		Cu.-N.	N	d <sup>0</sup> a. ● <sup>0</sup> p.	
3.	62.37	28.2	27.7	20.7	86.5	18.3	NW	1.2	10		N.	NE, N	d <sup>0</sup> a. ● <sup>0</sup> p.	
4.	61.09	28.1	27.2	20.6	87.2	18.2	N quad.	1.3	9.2		Cu.-N.	N	● <sup>0</sup> a. p.	
5.	61.10	28.7	25.8	21	82.8	18.2	NW	1.7	10		Cu.-N.	N	● <sup>0</sup> a. p. d <sup>0</sup> p.	
6.	60.73	25.7	33.1	21.2	80.7	19.2	NNW, SE	3	7	Ci.	N.	SW, S	● <sup>0</sup> a.	
7.	59.51	24.4	31.8	21.4	89.7	20.2	SE	3.5	7.5	Ci.	N.	S	Ω <sup>2</sup> a. p.	
8.	58.14	26.2	34.9	20.4	82.5	20.3	E, N	3	6.3		Cu.-N.	SW	d <sup>0</sup> a. ● <sup>0</sup> p.	
9.	57.91	26.2	34.2	23	81	20.4	NW quad.	3	7.5		Cu.-N.	E	d <sup>0</sup> a. ● <sup>0</sup> p.	
10.	59.21	26.3	31.1	23.5	80	20.2	NW N	1.2	7.5		Cu.-N.	N	d <sup>0</sup> a. ● <sup>0</sup> p.	
11.	59.45	27	35	23	78.2	20.2	SSE	1.2	7.5		Ci.-Cu.	SE, S	d <sup>0</sup> a. ● <sup>0</sup> p.	
12.	58.84	27.3	35.5	22.3	77.3	20.6	NW	1.2	4.3		Cu.	N	d <sup>0</sup> a. ● <sup>0</sup> p.	
13.	58.99	27.1	35.2	22.2	73.8	19.1	N quad.	1.2	4.5		Ci.	N.-cf.	NW	d <sup>0</sup> a. ● <sup>0</sup> p.
14.	60.11	26.4	32.1	22.5	75.7	19.1	NW quad.	1.3	4.3		Cu.	N	d <sup>0</sup> a. ● <sup>0</sup> p.	
15.	60.50	26.4	34.5	21.6	73	19.7	Variable	7	7		Ci.-S.	Cu.	NW	d <sup>0</sup> a. ● <sup>0</sup> p.
16.	59.56	26.3	35	20.2	76.3	18.9	SE S	7.5	0		Cu.	S	Ω <sup>2</sup> a.	
17.	59.39	27.3	36	21.8	69.7	17.9	SE	7.7	5		Fr.-Cu.	S	Ω <sup>2</sup> a.	
18.	59.41	26.5	37	18.9	72.3	18	Variable	7.7	1.2		Fr.-Cu., S.-Cu.	S	Ω <sup>2</sup> a.	
19.	59.48	26.5	36.5	20.4	70.2	18.5	SE	7.7	2.7		Fr.-Cu.	SE	Ω <sup>2</sup> a.	
20.	59.57	26.3	37.4	21	68	18	S	5	5		S.		Ω <sup>2</sup> a.	
21.	58.20	26.7	35.4	20	73	18.4	NW	7	3		Fr.-Cu.		Ω <sup>2</sup> a.	
22.	58.24	27.3	35.2	22.5	74.2	20.7	N quad.	1	6		Cu.	NW, N	Ω <sup>2</sup> a.	
23.	57.34	28.3	36.6	22.6	73.7	20.7	N quad.	2	5		Cu.	NW	Ω <sup>2</sup> a.	
24.	53.66	28.4	37.2	23.6	68	18.2	SE, N	2	3.5		Fr.-Cu.	SE	Ω <sup>2</sup> a.	
25.	61.23	25.5	32	23	80.7	19.4	NW	2.2	6.2		Cu.-N.	N	Ω <sup>2</sup> a.	
26.	61.70	24.4	29.2	21.5	84.8	19.1	N quad.	1.7	9.7		Cu.-N.	NE	Ω <sup>2</sup> a.	
27.	61.30	26.3	35.6	21.6	79.7	19.8	Variable	8	6.3		Cu.-N., Cu. sw.	S	Ω <sup>2</sup> a.	
28.	61.27	28	36.7	22.3	73.5	20	Variable	7.7	3.2		Fr.-Cu.	S	Ω <sup>2</sup> a.	
29.	61.10	28.4	37	23.4	72.2	20.5	Variable	7.7	4.5	Ci.	Cu.	SW	Ω <sup>2</sup> a.	
30.	61.18	27.8	37.3	21.7	69.5	18.5	SW	5	2.5		Cu.	S	Ω <sup>2</sup> a.	
31.	61.07	27.4	37.1	20	69	18.2	SW	1.7	4.7	Ci.	Cu.	SW, SE	Ω <sup>2</sup> a.	
Mean	760.18	26.2	33.8	21.4	77.5	19.2		.9	5.2					
Total													32.5	

## Meteorological data for first and second class stations.—Continued.

APARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total move- ment in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	763.38	24.4	28.1	21.6	74.8	16.9	NE	254.7	6	A.-Cu.	SW	S.-Cu., N. NE	12.7	● a.
2.	63.29	23.4	27	20.6	80.2	17.2	ENE	513.4	9.3	A.-Cu.	E	Cu.-N. NE	8.9	● a.
3.	62.71	23.5	27.2	20.9	83.7	17.9	E	318.1	10	A.-Cu.	E	S.-Cu., Cu.-N. E	10.6	● a.
4.	62.50	23.8	26	21.2	78.2	17.1	E	419.7	10			S.-Cu. E	5.6	● a. p.
5.	61.76	22.1	23.9	21.1	90.8	18	NE	608.7	10			N.	34.7	● a. p.
6.	60.56	24	27.9	21	89.8	19.8	NE quad.	314.9	6.7	Ci.		Cu.-N. SSE	5.6	● a.
7.	59.31	25.2	29.5	22	84.8	20.2	S quad.	252.1	6.3	Ci.-Cu.	SW	Cu.-N. E		● a.
8.	58.16	25.6	30.9	22.4	81.2	19.8	Variable	234.1	4	Ci.-Cu.	SW	S.-Cu. E		
9.	58.12	25.5	28.8	22.4	85.7	20.8	NE	278.5	6.3			S.-Cu. SW, E	2.3	● p.
10.	59.77	25.2	27	23.8	85.7	20.4	NE	368.5	8.7			S.-Cu. NE	3.3	● a. p.
11.	59.51	25.3	28.8	22.4	85.8	20.5	E quad.	155.3	6.3	A.-Cu.	W, SW	S.-Cu.		
12.	59.18	25.2	29.4	22.4	84.3	20	NE	261.6	7			S.-Cu., Cu.-N. NE, W		
13.	59.12	25.6	28.5	23.5	77.2	18.8	NE quad.	206.8	6.8	A.-Cu.	SW	S.-Cu. W, NE		
14.	60.61	25.6	29.1	23.6	73	17.8	NE	350.2	8.7	A.-Cu.	SW	S.-Cu. W, NE		
15.	60.50	25.4	28.3	23.1	75.2	18.2	E	278.8	8	Ci.-S.	S	S.-Cu. S		
16.	59.41	26.1	32.2	22.1	76.7	19	S	336.5	1.2	Ci.	SW	S.-Cu.		○ a. p.
17.	59.28	25.7	31.1	22.4	78.7	19.2	Variable	295.9	3.2	A.-Cu.	S	Cu. S		○ a. p.
18.	59.42	26.2	32.7	22.1	76.2	19.2	SE quad.	291.8	1.7	A.-Cu.	W	S.-Cu.		○ a. p.
19.	59.17	26.4	32.2	22.8	79.7	20.3	S	307	1.5	A.-Cu.		S.-Cu.		○ a. p.
20.	59.30	26.6	33	22.6	78.2	20	S	307.3	.3	A.-Cu.	N	S.-Cu.		○ a. p.
21.	58.33	26.1	30.4	22.1	80.2	19.9	NE	184.6	0					○ a. p.
22.	58.36	27.1	30.6	24.5	78.2	20.7	NE quad.	229.8	1.3			S.-Cu. N		○ a. p.
23.	58.18	26.4	30.9	22.5	82.5	20.9	Variable	237.7	2			Cu. S		○ a. p.
24.	60	26.6	30.4	23.4	80.8	20.7	N	247.3	3			Cu.-N., Cu. S	3.8	○ a. p.
25.	61.87	24.9	28.2	22.5	82.5	19.3	NE	488.9	10	A.-Cu.	W, SE	Cu.-N. NE	4.3	● a.
26.	62.08	23.6	25	22.5	87.2	18.9	E, ENE	580.8	9.7			Cu.-N. ENE	3	● a.
27.	61.49	24.8	28.8	21.6	84.2	19.5	E quad.	288.1	1			Cu. S	28.4	● a.
28.	61.42	26.2	29.4	22.7	81.3	20.5	NE	202.4	5.8			Cu.-N. E, NW		● a.
29.	61.29	26.9	30.5	23	78.2	20.5	Variable	230.8	.7			Cu.-N. S		● a.
30.	61.10	26	30.5	22.5	79.8	19.8	Variable	229.8	0					● a.
31.	60.81	26.6	31.5	22.1	74.5	19.1	S	321.2	.5	Ci.	S	Cu.-N.		● a.
Mean	760.32	25.4	29.3	22.4	80.9	19.4		309.5	5					
Total								9,595.3					123.2	

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, MARCH, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan	7.9	1	.2			4.1	1.5		2	10.4	8.1	.1	4.3	4.6	6.6	14.2
Zamboanga <sup>a</sup>		1.5				3.6	2.5			19.3	1	3.8	53.6	25.1	1.5	.5
Davao							12.4			14.2				5.1	53.3	1.3
Cotabato						.5				15.7		4.6		3.3	23.1	12.4
Cagayan, Misamis																
Dapitan	4.1								1.8					2.3	14.5	5.6
Butuan	10.9	2	.5			10.4	7.4	5.3		3.9	4.4	2.3		2.3	1.8	6.9
Dumaguete	1													1.3		
Yap, W. Carolines	.3				1			1.5		8.4	13.7	3.3				
Maasin	8.1						20.1									6.9
San Jose Buenavista		1.3					22.1									
Cuyo																
Borongan	1.3	9.4		7.2	2.8	4.1	2.8	7.3	.8	10.9	5.8		1.6	9.4	5.1	
Masbate	4.8	10.9		1	1.3											
Romblon	.8			.5		6.6					.5					
Laoang <sup>b</sup>	2		.3	2.3	13.5	1	3.5		1.5	1	2	.5		.5		.5
Gubat <sup>c</sup>																
Sumay, Guam		6.4	1.3	3.8										3.8	2.5	
Calapan	.5		.5	1.5		5.1	.3			.3						
Virac		1.6	.3		5.8	7.4	14.2	.3	.5		9.9					
Nueva Caceres <sup>b</sup>											.1					
Batangas	5.9															
Silang							2.5									
Santa Cruz, Laguna	.3			.8	1.3		.3									
Antipolo						1	3.3									
Iba				2			.3									
Tarlac							9.7									
Baler			3.3	24.7	27.7	6.1	1.6	1.8						1		
San Fernando, Union																
Echagüe	1	.3	2	6.9	3.5		4.8		2.8	12.7						
Candon					4.3		1.8									
Laoag																
Santo Domingo, Batanes	1	26.4	53.2	34.4	17.7	56.7	56.9	43.1	24.1	11.7	5.3	.8	1.5			

Station.	Day of month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Isabela, Basilan	1		7.4	1	42.7									.6	1.5	102	
Zamboanga <sup>a</sup>	3		3	1.5		3.3	4.8			.5					.8	126.4	
Davao	23.6		4.3	4.8			5.6								7.6	103	
Cotabato			14.2	3.3	3.6		2.5						2.8		13	125.7	
Cagayan, Misamis			4.6	2.6			7.9								1.5	76.2	
Dapitan				2												2	
Butuan			.8		.5	8.6	2.6									28.3	
Dumaguete			1.3													70.6	
Yap, W. Carolines	5.6	.8		.3			.3	.3					11.9		.5	3.6	
Maasin						7.1										47.9	
San Jose Buenavista			.3													42.2	
Cuyo																23.7	
Borongan		.8				.5		1.5	4.3	3	5.3	3.6		2.8		0	
Masbate										1.3						90.3	
Romblon																19.3	
Laoang <sup>b</sup>																8.4	
Gubat <sup>c</sup>																28.6	
Sumay, Guam					3.8				3.8		2	8.1		2	2.5	14.6	
Calapan	13.5	.3								1.5						25.4	
Virac		7.1								3.6		1	1.6		5.6	31.7	
Nueva Caceres <sup>b</sup>												6.9	1.8			59.4	
Batangas												2.7	.1			2.9	
Silang																5.9	
Santa Cruz, Laguna		.3	.3													2.5	
Antipolo										.5						3.3	
Iba										.5						4.8	
Tarlac																2.8	
Baler			.8						1.5	10.9	1			12.7	10.9	9.7	
San Fernando, Union																104	
Echagüe									1	4.1					5.1	0	
Candon																44.2	
Laoag																6.1	
Santo Domingo, Batanes							3.6	5.3	10	18	.8					0	
																370.5	

<sup>a</sup> 27 days of observation.<sup>b</sup> 23 days of observation.<sup>c</sup> 15 days of observation.

## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, MARCH, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Dapitan.		Butuan.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30	20.3	32.2	21.7	30.2	23.4	31.9	22	36.2	23.3	31.8	21.9	30.9	24.6	28.3	23.4
2	31.2	22.4	33.8	22.8	32.4	23.1	33.2	20.9	34.7	22.6	31.5	21.5	30.6	25	28.6	22.5
3	28.4	23.1	31.4	22.5	32.5	23.3	31.2	19.5	35.8	21.1	30.2	20.5	31.3	25.1	28.7	21.9
4	30.4	23	33.9	21.5	31.5	22	32.2	22.4	34.9	23	32	20.1	30.5	25.1	28.7	21.6
5	30.6	21.1	33.9	22.1	31.5	23	33.2	18.5	35.2	19.6	31.9	18.2	31.3	22	29.5	20.7
6	31.4	20.1	31.4	19.7	29.9	21.6	27.7	21.5	32.8	20.1	30	19.6	31.5	24.5	28	20.6
7	30	22.8	29	20.1	28.1	23	26.2	21.6	30.3	22.2	27.6	23.4	30	25	26.5	22.6
8	29	21	32.3	21.1	29.4	22.4	31.1	21.4	33.1	22.6	30	22.7	31.6	23.2	26.6	22.1
9	30.6	22.4	34.8	22.6	31.5	22.5	32.2	20.5	36.2	22.1	30.9	21.4	31.7	24.3	28.2	21.9
10	31	21.9	30.4	22.1	29.7	23.5	31	21.2	36.8	22.6	30.9	21.4	31.9	25.1	28.6	23.1
11	32.6	20.9	31.3	22.5	31.5	23.7	32.2	21.5	35.2	22.7	31.3	21	31.7	25	28.5	22.2
12	30	22.7	30.1	23.1	28.9	22.5	32.7	22.4	36.6	22.4	31.9	22.9	33.1	24.5	29	23.1
13	29.4	21.4	31	21.5	31.6	23.1	33.2	21.8	35.5	22.6	32.2	22.7	31.5	23.8	31	22.7
14	28.4	22.8	29.6	22.5	28.7	22.5	33.8	22.2	34.2	22.6	31.5	24	34.2	23.6	30	23.6
15	31.4	22.4	33.6	22.6	31.6	22.6	33.2	22	34.9	22.7	30.8	23.5	32.4	23.2	28	23.7
16	30	22.9	32.6	21.6	32	23.4	32.3	22	33.8	22.7	31.6	21.9	33.3	25.6	28.6	22.3
17	30.3	22.8	32.8	22.6	31.5	23.5	32.8	20.1	33.3	20.9	30.9	20.5	31.1	24.3	30.1	21.7
18	31.4	22.5	31.3	21.6	32.5	22	32.2	22.8	33.7	21.9	30.6?	22.4	31.7	24.3	29.5	22.4
19	29.9	20.9	32.8	21.6	30.9	22.9	32.1	22	33.8	21.7	31.9	22.1	32.1	24.9	30.1	23.5
20	28.9	23.2	30.6	21.8	28.1	23	32	22.8	30.4	23	31.9	23.4	32.5	25.5	31	23.1
21	28.4	21.8	33.1	21.3	30.8	22.8	32.3	19.6	33.3	20.7	30.7	19.5	32.6	25	29.5	21.2
22	30.4	21.7	32.1	21.3	29.9	21.6	32.1	22.5	32.9	21.5	31.4	22	33	22	27.6	23.3
23	30.6	21.4	33.6	21.6	31.4	21.6	30.9	22.2	35.2	22.4	32.5	22.4	32.2	24.8	29.1	21.8
24	31.5	22.7	32.8	20.6	29.6	23.6	33.6	20.4	34.3	20.9	32.5	20.5	32.4	24.2	30.6	22.1
25	30.9	20.7	32.1	20.6	31.6	23.5	34	21.9	35.4	21.3	32	20.9	33	23.9	31.5	22.8
26	31.5	21.4	31.6	21.6	29.6	23	29.9	21.9	33.8	22.6	32	21.5	32.9	25	30	21.2
27	31.8	20.9	33.3	21.1	-----	23.7	33.4	19	34.1	20.9	31.2	18.5	33.6	23	30.5	21.5
28	31	20.2	34.2	19.3	-----	-----	32.9	20.2	34.7	20.6	31.5	20	31.7	23.5	31.2	20.9
29	30.4	22.7	33.1	21.8	-----	-----	32.6	22.4	34.8	21.9	32.2	21	33.2	24.8	29.5	22.8
30	30.7	22.5	34.1	22.1	-----	-----	33.6	21.8	36.3	23.5	32.9	21.7	32.5	23.7	30.5	21.6
31	29.8	22	31.1	21.9	-----	-----	30.9	20.4	35.2	21.9	32.4	21.5	33	24	30.3	21.5
Mean	30.4	21.9	32.3	21.6	30.6	22.8	32	21.3	34.4	22	31.4	21.4	32.1	24.3	29.3	22.2

Day.	Dumaguete.		Yap, Carolines.		Maasin.		Cuyo.		Borongan.		Masbate.		Romblon.		Laoang.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	29.5	24.4	30.8	23.7	31.5	22	31	24.9	30	22	-----	24.2	33.5	22.6	30.9	21.5
2	30.3	23.9	30.6	23.9	31.3	21.7	29.6	25.1	30.1	19.9	-----	23.4	30.3	23.2	31.4	20.1
3	30.4	23	30	23.1	31	21.4	30	25	29.8	20.2	-----	23.4	33.3	22.1	31	19.6
4	30.1	24.3	31.1	23.4	31	22.9	31	24.8	30.2	21.2	-----	24.5	33.7	24.2	30.6	20
5	31.6	22.9	31.2	24.5	29	22.4	31.3	24.7	30	20.9	-----	24.6	34.7	23.6	30.5	20.4
6	30.4	23.8	32.8	23.9	30.6	22.2	31.3	25.3	30.2	23.8	-----	24.2	32.7	23.1	30.6	21.8
7	29.4	23.6	31.2	24.3	29	22.1	30.6	25	30.1	22.4	-----	24.4	33.4	24.3	30	21.1
8	29.4	23.5	31.3	24.5	28.6	22.1	31.4	24.3	30	22.3	-----	24.6	33.2	23.4	30	21.4
9	30.1	23.3	31.4	24.3	29.6	22.2	32.5	25.7	30.5	22.6	-----	24.8	34.1	23.4	30.9	21.2
10	29.9	23.1	30.9	24.9	30.5	22.1	32.3	25.9	28.9	23.3	-----	24.2	34.5	23.8	31	19.4
11	30.1	23.6	30.7	23.5	30.5	23.6	31.8	25.1	30.2	22.1	-----	23.5	33.2	23.6	31.4	19.4
12	30.2	23.9	31.8	23.5	31	23.3	32	25.2	30.7	22.4	-----	24.4	34.2	24.5	30	19.7
13	29.2	23.5	31.7	24	31.2	23.3	32.1	24.6	30.5	21.9	-----	25	34.9	21.3	31.8	20.6
14	30.2	23.5	31.7	23.9	31.2	23.4	32	24.1	30.6	22.3	-----	23	34.3	22.2	31.9	20.4
15	29.3	23.5	31.2	21.8	31.6	23.3	32	26.1	30.5	23.1	-----	24	34.8	24.3	32.5	20.8
16	31	24.1	31.2	24.6	31.8	23.2	31.6	25.1	30.6	23.1	-----	25	33.5	24.9	31.6	21.5?
17	31.3	25	30.7	23.8	31.5	23.4	32	25.4	30.9	24.5	-----	24.2	34.5	23.5	31.6	20.6?
18	31.1	24.6	30.8	24.6	31.6	22.7	32.4	25.4	30.9	20.8	-----	24.8	34.1	24.5	31.2	19.9
19	29.2	24	31.3	23	31.4	22.9	32.8	24.9	30.6	24.3	-----	24.8	34.8	23.4	31.1	21.1?
20	30.2	24.1	31.5	24	31.4	23.6	31.8	24.5	30.7	24	-----	23.6	34.2	24.7	31.1	19.6
21	30.3	24.9	31.3	24.6	31.6	22	30.9	24.6	30.6	20.1	-----	22.5	33.5	24.1	31.4	18.4
22	29.7	22.5	32.3	24	31.6	22.8	31.9	22.6	30.9	20.1	-----	22.5	34.6	19.7	32.1	18.3
23	29.3	24.4	32.8	23.6	31.5	22	32.4	24.6	31	21.1	-----	23.6	34.1	20.6	31.6	19.4
24	29.3	25.4	31.9	24.3	31.7	22	32.3	25.5	31	25.2	-----	23	34.5	23.4	-----	-----
25	29.3	22.8	32.3	24.5	31.6	22	31.8	25.3	30.7	21.9	-----	23	34.6	21.5	-----	-----
26	28.9	23.8	32.1	24.7	31.2	21.7	31.9	25.5	31	24.3	-----	24.5	34.2	21.7	-----	-----
27	29.6	25.4	31.2	25.1	31.6	21.8	33.7	23.4	30.7	21.3?	-----	22	34.2	23.4	-----	-----
28	29.8	21.2	31.6	23.5	31.2	22.8	31.9	25.6	30.4	23	-----	23	34.8	23.3	-----	-----
29	30.3	24.8	31.1	23.5	31.6	22.6	32.4	25.5	30.6	24.9	-----	24.2	34.4	24.9	-----	-----
30	29.7	22.8	32.5	23.5	31.6	22	32.2	25.1	30.5	19.5	-----	24.2	34.7	24.8	-----	-----
31	30.6	22.8	31.7	25	31.4	23.8	32.1	25.1	30.6	21	-----	24	34.3	24.7	-----	-----
Mean	30	23.8	31.4	24	31	22.6	31.8	25	30.5	22.2	-----	23.9	34	23.3	31.1	20.3

Maximum and minimum temperatures for third-class and rain stations, March, 1913—Continued.

Day.	Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Silang.		Sta. Cruz, Laguna.		Antipolo.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30	23.4	30	23.4	29.5	23.7	30.7	19.9	30.5	19.1	30.1	19.3	28.2	21.7	33.3	20.5
2	29	22.4	29	22.4	29.5	23	30.6	22.1	30.5	19.6	30	19.6	29.9	22.5	33.8	20.5
3	27.2	24	27.2	24	31.4	21.5	30.8	20.5	30.7	19	30.7	19	30.4	21.5	33.3	19.3
4	27.6	23.6	27.6	23.6	29.4	23.3	31.5	20	31.2	19.2	31.2	19.2	29.3	23	32.1	21.3
5	29	24	29	24	30.2	23.5	30.5	21.7	31.5	19.5	31.5	19.5	30.7	21.3	33.2	19.7
6	29.2	24	29.2	24	30.7	23.3	31	21.5	31.8	19	31.8	19	30.9	21.9	32.3	20.3
7	29.8	24.2	29.8	24.2	30.3	22.6	30.9	21.3?	30.2	18.8	30.2	18.8	31.1	21.5	31.7	20.3
8	29.8	24	29.8	24	31	22.6	31.2	22	30.5	19.3	30.7	19.3	31.4	21.2	32.3	20.5
9	30	23.8	30	23.8	30.6	23.2	31	20.8	33.1	19.1	31.4	19.8	33.4	22.1	34.5	21.1
10	30.4	22.2	30.4	22.2	31.2	23.2	30.8	20.5	32.5	18.4	32	20	32	22.2	33.6	20.7
11	28.6	24	28.6	24	31.5	22.2	31.8	20	31.9	18.6	32.4	19.4	31.7	22.7	34.8	21.7
12	30.2	23.4	30.2	23.4	30.4	22.1	31.1	21.5	33.8	21.7	32.3	19.8	32.4	21.9	34.3	19.7
13	30	20.2?	30	20.2?	32.5	22	30.9	20.4	33	19.4	32	19.9	33.1	22.7	33.8	22.3
14	29.8	22.4	29.8	22.4	31	22.2	30.7	20.4	33.4	18.6	32.6	19.4	32.2	21.9	33.9	21.7
15	28.8	23.4	28.8	23.4	31.5	22.5	31.6	20	34.3	18	31.7	19.1	31.4	22.2	34.6	21.7
16	30	24	30	24	31.1	25	31	21?	33.4	17.5	30.8	19.6	31.4	23	33.4	21.7
17	30.2	25.5	30.2	25.5	31.2	21.5	32.5	20	32.1	17.4	31.5	19.4	31.4	20.8	34.1	19.8
18	30	24.9	30	24.9	31.3	22.4	30.6	20	32.8	17.3	32	20.1	32.4	23.2	35.2	20
19	30.5	25.8	30.5	25.8	31.1	22.4	30	20.2	34.4	18.3	32.1	19.6	32.3	23.6	34.2	20.5
20	30.2	22.9	30.2	22.9	31.6	23.6	32.4	20.1	33.5	18.5	32.4	19.3	32.5	22.8	34.5	20.8
21	30.3	22.2	30.3	22.2	31.3	21.4	31.2	19.4	35.1	16.3	32	19.9	34	21.5	34.6	20
22	30.6	21.6	30.6	21.6	31.5	20	32	18.3	33.2	16.5	32.2	20	32.6	20.1	33.4	20.3
23	30.6	24.8	30.6	24.8	30.8	20.3	30.9	19	32.9	16.2	32.1	20.3	31.5	21.7	35.4	21
24	31.1	25.4	31.1	25.4	31.1	21	32.3	19.5	33.5	15.8	32.5	20	32.6	20.9	34.6	19.4
25	31.3	19.8	31.3	19.8	31.6	20.5	31.8	18	32.5	15	32.4	20.1	32	20.8	34.3	21.2
26	29.2	24.4	29.2	24.4	31.5	22.1	31.1	20.5?	34.1	15.8	31.7	20.5	31.6	20.4	32.6	20.5
27	30.6	22.2	30.6	22.2	31.9	22.5	32.4	19	31.9	17.2	31.5	20.1	33	22.2	33.5	21.3
28	30.5	21	30.5	21	32.1	22.1	32.4	20	31.9	15.5	31.9	20.3	33.2	20.8	34.5	19.7
29	30.4	25	30.4	25	31.7	23.7	31	21.6	32.4	21	32.2	19.8	30.6	22	33.8	20.7
30	30.8	25.7	30.8	25.7	33.5	23.5	30.8	21.3	33.5	17.6	31.3	19.9	32	22.5	34	21.8
31	30.9	23.5	30.9	23.5	31.5	22.6	32.1	21.5	33	19.8	31.6	20.1	31.7	22.4	33.7	21.8
Mean	30.4	23.6	30.4	23.6	31.1	22.4	31.3	20.4	33	17.8	31.6	19.7	31.7	21.9	33.8	20.7

Day.	Iba.		Tarlac.		Baler.		San Fernando, Union.		Echagüe.		Candon.		Laoag.		Sto. Domingo, Batanes.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	32.5	18.9	35.1	20.6	30.2	20.8	31	20.5	29.6	19.7	29.7	21	32.6	18.2	25.4	19
2	32.9	19.5	35.6	21	31.4	20.9	30.3	21.1	30.3	17.8	29.9	22.4	33.9	20.7	25.2	18.6
3	30.9	18.4	35.8	21.7	29.7	23.2	30.8	20.2	27.2	20.5	30.5	22.4	33.7	21.3	25.8	19
4	32.6	20.5	34.4	22.8	28.2	21.9	30.6	22	26.4	20.6	29.9	23.5	34.8	18.1	24	18.7
5	31.1	22.5	34.8	20	29.7	22	31.3	24.7	28.3	20.4	29.2	25.1	31.5	23.8	24.6	18.6
6	33	20.9	36.1	21.5	28.7	21.5	31.6	22.8	29.7	21.1	29.9	24.4	33.6	23.1	25.6	18.2
7	31.4	20.9	36.2	21.4	28.7	22.2	32.2	22.7	29.3	21	30	23.2	32.6	21.5	25.6	20.6
8	31.4	22.5	36.1	21.5	29.7	21.7	31.5	24.6	32.5	20.9	30	23.2	31.8	23.7	25.3	21.2
9	31.7	21.4	34	22.1	29.9	22.4	32	23.6	33.3	20.6	30.5	23.1	33.8	22.7	25.1	20.8
10	32.4	22.4	36.7	22.2	29.9	21.6	31.8	24	32.3	23.1	31	23.9	34.8	23	24.8	20.4
11	32.5	20	37.5	21.9	30.5	20.6	32.8	22.9	32.5	22	30.4	25.7	32.4	24.2	25	20.4
12	32.7	21.3	37.5	21.8	30.3	20.2	31.6	23.1	33.6	20.7	30.5	24.1	31.8	22.6	25.4	20.9
13	32.5	20.5	37.4	22	30.8	22	31.6	21.5	33.2	22.4	30.3	21	33.6	20.2	27.7	20.9
14	33.5	21.7	38.6	22	31.4	23	31.4	23.6	32.7	22.6	30.9	23	33.5	21	25.7	19.4
15	33	23.1	35.2	20.4	31	23.9	32	22.6	33.4	22.6	30.9	23.7	32.5	21.6	27.8	21.6
16	34.5	19	36.2	20.3	30.6	24.7	34	21.8	33.3	19.7	30.5	23.4	31.6	23	30	22.6
17	33.5	18	36.7	20	30.5	20.1	31.5	23.2	33.3	18.6	30	23.7	32.9	21.2	30.2	20.9
18	32.1	18.7	38.5?	19	31.2	19.2	30.9	21.1	33.6	17	30.8	23.6	33.6	22.6	30.3	23.2
19	32.3	20	34.5	20	30.5	20.1	32.7	22	33.7	19.5	30.5	23	33.4	22.9	30.7	22.4
20	32.9	19.5	33.7	19.8	29.2	20	32.6	22.6	34.3	19.4	30.7	24.5	32.4	22.3	31	23.4
21	32.5	19	37	20	32.3	19	32.5	21.9	34.7	19	30.9	22.7	32.4	21.2	29.5	22.4
22	32.4	19	38.5?	20.1	31.7	20.6	32.1	22.1	33.8	20.9	31.5	25.1	33.6	23	27.5	21.8
23	32.4	19.9	38?	22	31	21.5	32.5	21.7	34.3	22.6	31.8	22.5	33	20.5	30.9	21.6
24	33	22.1	36.2	22	31.8	20	32.3	22.6	34.4	19.7	30.6	22	32.6	19.6	28.6	22
25	34.3	20	35.5	20.1	31.3	21.5	31.5	21.5	33.3	22.4	30.4	22	32.9	23.5	21.8	19.6
26	32.4	21.5	37.2	22.6	28.2	23.3	30.3	24.4	28.3	21.4	30.5	21.9	34.7	21	23.9	18.5
27	32.9	19.9	33.8	20.1	28.7	20.5	32.3	21.6	31.9	19.4	30.8	25.5	32.2	23.2	24.7	18.4
28	33	18.5	37.4	19.8	30.3	19.2	32.7	23.5	34.4	18.8	30.8	24	32.8	22	27.6	21.4
29	33.2	19.5	37.7	20.5	31.5	20.7	31.6	23.8	34.4	20	30.8	23.8	32.9	21.1	28.5	21.2
30	32.6	20.6	34.7	22.6	30.8	20.8	33.4	23.7	34.5	21	30.6	23.2	32.3	19.6	29.6	20.2
31	32	19.5	34.8	19.5	28.9	21.9	32	22.1	32.8	18.9	31.4	23.2	33.5	23.3	30	23
Mean	32.6	20.3	36.2	21	30.3	21.3	31.9	22.6	32.2	20.5	30.5	23.3	33	21.8	27	20.7



# SEISMOLOGICAL BULLETIN FOR MARCH, 1913.

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## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

The earthquakes felt during the month in the Philippines, over and above those that may be considered as precursory shocks or repetitions of the great earthquake that took place in the Molucas and Mindanao on the 14th, are as follows:

1, 14<sup>h</sup> 30<sup>m</sup> 16<sup>s</sup> \* [2, 0<sup>h</sup> 00<sup>m</sup> 16<sup>s</sup>]. **Guam** (Mariana Islands). Earthquake of intensity III. The epicenter was some distance from Guam, probably to the SE where it had greater intensity, for the shock was registered on the seismographs both of the Far East and Europe as follows:

	h.	m.	s.		h.	m.	s.
Manila, P. I. ....	14	30	16	Sydney, Australia .....	15	09	12 (e)
Taihoku, Formosa .....	14	31	54 (e)	Aachen, Germany .....	14	53	00 (e)
Zikawei, China .....	14	35	20 (eL)	Strassburg, Germany .....	15	15	00 (L)
Irkutsk, Russia .....	14	37	42				

3, 0<sup>h</sup> 30<sup>m</sup> [3, 8<sup>h</sup> 30<sup>m</sup>]. **Legaspi** (SE Luzon). Earthquake of intensity II-III.

12, 16<sup>h</sup> 40<sup>m</sup> [13, 0<sup>h</sup> 40<sup>m</sup>]. **Butuan** (N Mindanao). Oscillatory earthquake, direction ENE-WSW, intensity II-III.

17, 0<sup>h</sup> 52<sup>m</sup> 54<sup>s</sup> \* [17, 8<sup>h</sup> 52<sup>m</sup> 54<sup>s</sup>]. **NE Mindanao and Eastern Visayas**. Earthquake of intensity IV-V in Butuan and Surigao and of intensity III in the neighbouring islands of Leyte, Bohol, and Cebu. The epicenter was probably in the eastern part of Butuan Bay.

17, 2<sup>h</sup> 12<sup>m</sup> 42<sup>s</sup> \* [17, 10<sup>h</sup> 12<sup>m</sup> 42<sup>s</sup>]. **Camarines and Albay** (SE Luzon). Earthquake of intensity III-IV.

18, 14<sup>h</sup> 10<sup>m</sup> 46<sup>s</sup> \* [18, 22<sup>h</sup> 10<sup>m</sup> 46<sup>s</sup>]. **Legaspi** (SE Luzon). Oscillatory earthquake, direction S-N, intensity III, duration 4 seconds.

21, 2<sup>h</sup> 43<sup>m</sup> 19<sup>s</sup> \* [21, 10<sup>h</sup> 43<sup>m</sup> 19<sup>s</sup>]. **SE Luzon**. Earthquake of intensity III in Legaspi, where vertical movements followed by oscillations in the direction SSE-NNW were noted lasting 8 seconds; in Gubat the oscillations appeared to have the direction N-S and intensity II-III.

21, 21<sup>h</sup> 50<sup>m</sup> 26<sup>s</sup> \* [22, 5<sup>h</sup> 50<sup>m</sup> 26<sup>s</sup>]. **W Luzon**. Earthquake felt with intensity IV in Baguio and II-III in Bolinao. The epicenter was close to the NE coast of the Lingayen Gulf.

23, 21<sup>h</sup> 09<sup>m</sup> [24, 5<sup>h</sup> 09<sup>m</sup>]. **Aparri** (NE Luzon). Oscillatory earthquake, direction E-W, intensity III, duration 3 seconds.

25, 9<sup>h</sup> 50<sup>m</sup> [25, 17<sup>h</sup> 50<sup>m</sup>]. **Cotabato** (SW Mindanao). Oscillatory earthquake, direction E-W, intensity III-IV, duration 3 seconds. The epicenter was in the interior of the

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observer who sent the report. All time indications are in Greenwich mean time (midnight=0<sup>h</sup>), insular time being added in brackets for the convenience of Philippine readers.

district, since according to information received the intensity and duration was greater in Tamontaca and other places situated to the SE and E of Cotabato.

27, 12<sup>h</sup> 51<sup>m</sup> 20<sup>s</sup> \* [27, 20<sup>h</sup> 51<sup>m</sup> 20<sup>s</sup>]. Central Mindanao. Earthquake felt in the districts of Dapitan, Misamis, Lanao, Cotabato, and the N of the Agusan Valley. It had intensity IV-V in Dapitan where there were also two repetitions of intensity III-IV at intervals of 10 minutes. In Cotabato it had intensity IV and II-III in Butuan. The epicenter was probably to the NW of Illana Bay.

29, 17<sup>h</sup> 52<sup>m</sup> 52<sup>s</sup> \* [30, 1<sup>h</sup> 52<sup>m</sup> 52<sup>s</sup>]. Dapitan and Cotabato. Earthquake of intensity IV in Dapitan and II-III in Cotabato. This was very probably a repetition of the previous earthquake and originated from the same center.

29, 18<sup>h</sup> 57<sup>m</sup> 36<sup>s</sup> \* [30, 2<sup>h</sup> 57<sup>m</sup> 36<sup>s</sup>]. Legaspi (SE Luzon). Oscillatory earthquake, direction S-N, intensity III, duration 10 seconds.

#### THE EARTHQUAKE OF SIAO, SANGIR, TALAUT, AND MINDANAO.

At 8<sup>h</sup> 47<sup>m</sup> 38<sup>s</sup> of the 14th [14, 16<sup>h</sup> 47<sup>m</sup> 38<sup>s</sup>] the seismographs of Manila and Baguio as well as those of the rest of the world recorded a distant earthquake which was very characteristic both on account of its duration as well as the amplitude of the records. As the only telegraphic reports received in Manila were from Samar and Leyte, where it was felt but slightly, it was thought that the epicenter must have been in the Pacific at some distance to the E or SE. Some time after the mail brought more alarming reports from the E and SE regions of Mindanao, where the shock had been felt with violent intensity during an extraordinary long period of time. As in the region of greater intensity, i. e., around Davao Gulf, and in the island of Sarangani only relatively slow horizontal undulations of great amplitude had been observed, it was deduced that the true epicenter must have been beyond the Island of Mindanao toward the SE or S. Finally a cutting from the Sydney Evening News of April 1 gave us the true origin of the earthquake. The cutting read as follows:

AMSTERDAM.—News has just been received of a severe earthquake on March 14 in the Dutch East Indies.

The islands of Siao, Sangir, and Talaut, northeast of the Celebes, suffered heavily, several villages being destroyed. One hundred and seven persons are reported to have been buried alive.

From this it would appear that the epicenter of this earthquake was close to the mentioned Islands or perhaps between them and the extreme S of Mindanao, between parallels 3° and 5° N and meridians 125° and 127° E.

This earthquake was without doubt a very large one, and if the damage done was relatively slight, this was owing to the fact that in and around the epicenter there was little inhabited land.

Below are given the data received from Mindanao and the Visayas, relative to this earthquake:

1. Earthquakes felt in Sarangani, which is some 200 kilometers from the epicenter, recorded before the great shock and which may be considered as foreshocks.

March 3, 7<sup>h</sup> 15<sup>m</sup> (3, 15<sup>h</sup> 15<sup>m</sup>) intensity IV, direction S-N.  
 11, 0<sup>h</sup> 40<sup>m</sup> (11, 8<sup>h</sup> 40<sup>m</sup>) intensity III, direction S-N.  
 12, 9<sup>h</sup> 47<sup>m</sup> (12, 17<sup>h</sup> 47<sup>m</sup>) intensity IV, direction S-N.  
 14, 1<sup>h</sup> 00<sup>m</sup> (14, 9<sup>h</sup> 00<sup>m</sup>) intensity IV.  
 14, 8<sup>h</sup> 00<sup>m</sup> (14, 16<sup>h</sup> 00<sup>m</sup>) intensity IV.

#### 2. Summary of the reports of the great earthquake:

Heavy quake; direction N-S; duration 25 seconds. It was a double shock. Heavy trees and posts fell. During the following night there was a continuation of slight shocks. W. S. Coe, Sarangani.)

This earthquake must be considered as a severe one; from the very beginning I observed some of the oscillations and the movements of the church and convent to be so large that it was a marvel that



they were not brought to the ground. Not being able to remain upright I knelt down, but even so I could not keep still, so I lay down on the ground till the vibrations ceased which appeared to me to be about two minutes. The earthquake seemed to be entirely oscillatory, without vertical shocks, which was the reason so little damage was done. Several walls in the church and convent were thrown down, while in the town the nipa houses rocked a good deal and many of them remained out of plumb, and crockery was broken in all of them. I am told that fissures opened in the ground in several parts of the town. (Rev. R. Peruga, S. J., Davao.)

A very violent earthquake from SE-NW, which lasted from four to five minutes. Before the first movements there were subterranean noises from the SE which lasted two minutes. Clocks were stopped and bottles and other objects fell from the shelves in the houses, bells rang, and fissures were opened up from which water and fine sand came. The débris fell to the SE. (D. L. Garcia, observer, Davao.)

The earthquake on the 14th was the heaviest felt in the Umayan district during the last two years. The heaviest part of the shock lasted for two minutes and thirty-five seconds, but the slight trembling was felt for three minutes. Having no instruments, I know of no way to calculate the intensity of the shock except by the excitement it caused among the people. The Manobos are more afraid of an earthquake than any other thing, and needless to say were considerably terrified on this occasion. There was no noticeable effect of this earthquake afterwards, except the few fallen trees that were broken off by the shock. This is not uncommon in this section, however, for almost the slightest shock will cause some of the large trees to fall; this is probably on account of the soil being so water-soaked during the rainy season that these trees are easily uprooted. (D. H. Malone, District of Umayan, S of the Agusan Valley.)

Very strong earthquake; duration one minute and fifty-eight seconds. During the few days following there were three other shocks of slight intensity. (Rev. J. Garriga, S. J., Baganga.)

I was preaching in the church at the time of the shocks and seeing that they lasted so long we all went out into the open air. I thought that the whole place would be destroyed, for the ground seemed to go round and the beams of the houses creaked ominously. I am not quite sure how long it lasted, but I think that it was more than two minutes. (Rev. C. Sastre, S. J., Talacogon.)

The earthquake of the 14th was the most severe that I have felt during my three years in the Philippines. Thanks be to God, the effects of the earthquake in the town were not great. The bells rang during the shock. It lasted about two minutes. (Rev. Walter Panis, Tandag.)

There were three distinct series of oscillations, all very strong and in the direction SSE-NNW. They were felt by everyone in the neighborhood. Clocks stopped and objects fell from the shelves in the houses, especially in the shops of the Chinos. The earthquake lasted some four minutes. (D. Patricio Yabao, observer, Cotabato.)

Very violent earthquake; direction SSE-NNW, duration some two minutes. It was not remarkable for its intensity, but very remarkable on account of its long duration. The people who were in the church at the time were terror stricken and began to weep when they noted the unusual duration of the shock and heard objects falling. No damage was done to the houses. The water in the river was agitated a good deal and moved from E-W, and the boats rocked greatly. I think that the earthquake must be designated as strong on account of its long duration. According to reports received from the neighboring towns of Cabarbaran and Jabonga it would seem that the shock was felt with the same intensity as in Butuan, its duration being also about two minutes. Several boatmen who were out at sea near Surigao told me that they felt the shock and that it caused waves to rise.

Some farmers who were planting rice in the lowlands some 6 miles farther north say that the vibrations were so great and visible that they could scarcely stand upright; they appeared to come from the S. The fields, which before were just wet, remained covered with water in several places. (D. Generoso Copin, observer, Butuan.)

The earthquake of the 14th had no evil effects; it was remarkable only on account of its duration, not on account of its violence or damage. There were long softly surging movements. (Rev. J. Menken, Cantilan.)

The reports received from Zamboanga, Dapitan, and Cagayan indicate that the earthquake had an extraordinary duration throughout the whole of the Island of Mindanao. It was also perceptible in the Islands of Cebu, Bohol, and Leyte.

The preceding data give us a fair idea of the great extent of the earthquake. Supposing that the middle point of the line or area of origin of the shocks was between the Islands of Sangir and Talaut, the isoseism VIII would then run northward some 500 kilometers, while the shock itself was perceptible in the same direction as far as Tacloban (Leyte) which is just under 900 kilometers distant.

That the earthquake was perceptible throughout the Island of Leyte, in the S of

Samar, and in Cebu and Bohol, but not in Negros and Panay, would indicate that the movements extended more to the N than to the NW.

From the reports given above it is fair to deduce that the intensity was greater in the Agusan Valley than in Cotabato and on the eastern coast of Mindanao. It appears therefore very probable that the hypocenter of the earthquake was a line or fracture in the direction N-S, which may possibly be a continuation of the seismotectonic line of the Agusan and the Gulf of Davao.<sup>1</sup>

The large duration of the earthquake is well worth consideration, especially in the Island of Mindanao, which was within the isoseism V; in none of the reports is this duration given as less than two minutes. The same is true of the character of the undulations, which were large and slow, not sudden or violent, even in Davao and Sarangani, where the intensity was VIII-IX.

3. Aftershocks perceptible in Sarangani and the SE of Mindanao:

15, 7<sup>h</sup> 50<sup>m</sup> [15, 15<sup>h</sup> 50<sup>m</sup>]. Sarangani. Repetition of intensity IV.

16, 6<sup>h</sup> 18<sup>m</sup> 28<sup>s</sup>\* [16, 14<sup>h</sup> 18<sup>m</sup> 28<sup>s</sup>]. Sarangani and Davao, V.

17, 6<sup>h</sup> 15<sup>m</sup> [17, 14<sup>h</sup> 15<sup>m</sup>]. Sarangani, IV.

21, 3<sup>h</sup> 16<sup>m</sup> [21, 11<sup>h</sup> 16<sup>m</sup>]. Sarangani and Davao, IV.

24, 4<sup>h</sup> 50<sup>m</sup> [24, 12<sup>h</sup> 50<sup>m</sup>]. Sarangani, III.

27, 1<sup>h</sup> 40<sup>m</sup> [27, 9<sup>h</sup> 40<sup>m</sup>]. Sarangani, III.

As the preceding data comprehend only the Island of Mindanao, which is but a small sector in the N of the epicenter of this earthquake, and as up to the present no further reports as to the extent and intensity in other directions have come to hand, it is impossible to draw a seismic map or to point out the probable connection this earthquake had with the great Philippine Deep, whose SW edge fell probably within the meizoseismic area.

In conclusion we may add that from the 17th to the 30th of the following month of April there were a great number of earthquakes in the Peninsula of Surigao and the north part of the Agusan Valley, some 500 kilometers to the N of the epicenter of the 14th, there being as many as 30 shocks on some days varying from III to VII-VIII of the Rossi-Forel scale.

#### RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0<sup>h</sup>. Instrument: Wiechert seismograph; 1,000 kilograms. A<sub>N</sub>: T<sub>0</sub>=5.3,  $\epsilon$ =1.98,  $\frac{r}{T_0^2}$ =0.054; A<sub>E</sub>: T<sub>0</sub>=6.4,  $\epsilon$ =3.23,  $\frac{r}{T_0^2}$ =0.024. Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> $\mu$	A <sub>E</sub> $\mu$	
65	1	IIr	eP	h. m. s.				Guam (Mariana Islands).
			S <sub>N</sub>	14 30 16				
			S <sub>E</sub>	34 34	4-5			
			L <sub>N</sub>	35 00	6-7			
			L <sub>E</sub>	37 39	6-7			
			M <sub>E</sub>	38 00	6-7			
			M <sub>E</sub>	39 21	7		393	
			M <sub>N</sub>	40 11	7	278		
			F	15 22				
66	2	Id	eP	4 44 00				
			L	44 07				
			F	47				
67	3	I	eP	20 05 47				
			L	08 42				
			M <sub>E</sub>	08 50	6		372	
			M <sub>N</sub>	08 54	6-7	148		
			F	55				

<sup>1</sup> See Monthly Bulletin for August, 1910.

## Records of the microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
68	4	Ir	eP	<i>h. m. s.</i>				
			S	6 58 38				
			L	7 01 20				
			M <sub>N</sub>	03 36				
			M <sub>E</sub>	06 27	12	28		
69	5	Ia	F	07 22	10		30	
				43				
			eP	5 41 49				
			L	42 03				
			F	45				
70	6	I	eP	0 50 55				
			L	51 32				
			M <sub>N</sub>	51 47	2-3	71		
			F	1 03				
71	6	Ir	eP	11 11 28				
			S	17 26				
			L	20 44				
			M <sub>E</sub>	29 00	15		22	
			M <sub>N</sub>	29 02	15	16		
72	8	Ia	F	59				
			eP	19 06 22				
			L	06 36				
73	10	Ia	F	09				
			eP	20 21 44				
			L	21 58				
74	11	Ia	F	25				
			eP	21 33 56				
75	11	Ia	F	37				
			eP	23 49 50				
			L	50 05				
76	12	Ir	F	53				
			eP	21 41 48				
			S	44 33				
			L	46 38				
			M <sub>E</sub>	48 08	16		28	
77	14	IIr	F	22 27				
			eP	8 47 38				
			L	50 13				
78	14	Iv	F	11 12				
			eP	9 00 45				
79	14	Iv	eP	9 02 14				
80	15	I	eP	10 04 38				
			F	15				
81	16	I	e	6 18 28				
			F	34				
82	17	Iv	e	6 18 28				
			F	34				
			eP	0 52 54				
			L	54 26				
83	17	Iv	M <sub>N</sub>	55 13	8	69		
			F	1 25				
			eP	2 12 42				
			L	13 18				
84	18	I	M <sub>N</sub>	13 24	2-3	23		
			F	21				
			e	1 15 21				
85	18	I	F	29				
			e	6 22 32				
86	18	Iv	F	58				
			eP	14 10 46				
			L	11 29				
			M <sub>N</sub>	13 04	6	54		
87	19	I	F	40				
			e	15 12 00				
			L	15 04				
88	19	Ir	F	45				
			eP	18 48 02				
			S	51 06				
			L	53 32				
			M <sub>E</sub>	53 58	15		12	
			M <sub>N</sub>	55 00	14	11		
			F	19 50				

Horizontal pendulums.—Siao, Sangir, and Talaut Islands.

From Vicentini.—The end is indefinite, because it is confused with the preceding earthquake.  
End confused with earthquake No. 77.

Aftershock.

NE of Mindanao and eastern Visayas.

Camarines and Albay (SE of Luzon).

Legaspi (SE of Luzon).

Northern Formosa.

## Records of the microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
89	21	Iv	eP L F	<i>h. m. s.</i> 2 43 19 44 03 50				SE of Luzon.
90	21	I	e F	12 30 50				
91	21	Iv	eP L M <sub>N</sub> F	21 50 26 50 52 51 03 58	1-2	71		W Luzon.
92	22	Id	eP F	14 49 51 52				
93	22	Id	eP L F	20 36 02 36 17 39				
94	23	IIr	eP S <sub>N</sub> S <sub>E</sub> L <sub>E</sub> L <sub>N</sub> M <sub>E</sub> M <sub>N</sub> F	20 52 07 56 06 56 18 21 00 22 00 26 01 22 02 13 22 44	6 6-7 7-8 6-7 7 7		237 231	
95	24	I	e F	15 56 16 15				
96	26	Ir	eP L M <sub>E</sub> F	21 39 04 41 47 42 00 22 12	7		80	From this date till April 1 the records were taken from the Horizontal Pendulums, because the Wiechert seismograph was under repair.
97	27	I	e F	9 14 27 36				
98	27	Iv	e F	12 51 20 13 04				Central Mindanao.
99	29	Iv	eP F	17 52 52 18 03				Dapitan and Cotabato.
100	29	Iv	eP L M <sub>N</sub> F	18 57 36 58 26 58 42 19 02	1-2	30		Legaspi (SE of Luzon). •
101	31	Ir	eP S L M <sub>E</sub> F	3 51 28 56 14 4 00 11 02 20 5 08	8		73	

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

Los temblores de tierra sentidos durante este mes de Marzo en Filipinas que no pueden considerarse como choques precursores o repeticiones del gran terremoto que tuvo lugar el día 14 en las Islas Molucas y Mindanao, son los que a continuación se enumeran:

1, 14<sup>h</sup> 30<sup>m</sup> 16<sup>s</sup> \* [2, 0<sup>h</sup> 00<sup>m</sup> 16<sup>s</sup>]. Guam (Islas Marianas). Temblor de tierra de intensidad III. Su epicentro se hallaba algo lejos de Guam, probablemente hacia el SE donde tuvo sin duda mayor intensidad, puesto que lo registraron los seismógrafos tanto del Extremo Oriente como de Europa, según consta por los datos siguientes:

	h.	m.	s.		h.	m.	s.
Manila, P. I. ....	14	30	16	Sydney, Australia .....	15	09	12 (e)
Taihoku, Formosa .....	14	31	54 (e)	Aachen, Alemania .....	14	53	00 (e)
Zikawei, China .....	14	35	20 (eL)	Strassburg, Alemania .....	15	15	00 (L)
Irkutsk, Rusia .....	14	37	42				

3, 0<sup>h</sup> 30<sup>m</sup> [3, 8<sup>h</sup> 30<sup>m</sup>]. Legaspi (SE de Luzón). Temblor de tierra de intensidad II-III.

12, 16<sup>h</sup> 40<sup>m</sup> [13, 0<sup>h</sup> 40<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección ENE-WSW, intensidad II-III.

17, 0<sup>h</sup> 52<sup>m</sup> 54<sup>s</sup> \* [17, 8<sup>h</sup> 52<sup>m</sup> 54<sup>s</sup>]. NE de Mindanao y Visayas Orientales. Temblor de tierra de intensidad IV-V en Butuan y Surigao, y de intensidad III en las vecinas islas de Leyte, Bohol y Cebú. Su epicentro probablemente se hallaba en la parte oriental de la bahía de Butuan.

17, 2<sup>h</sup> 12<sup>m</sup> 42<sup>s</sup> \* [17, 10<sup>h</sup> 12<sup>m</sup> 42<sup>s</sup>]. Camarines y Albay (SE de Luzón). Temblor de tierra de intensidad III-IV.

18, 14<sup>h</sup> 10<sup>m</sup> 46<sup>s</sup> \* [18, 22<sup>h</sup> 10<sup>m</sup> 46<sup>s</sup>]. Legaspi (SE de Luzón). Temblor oscilatorio, dirección S-N, intensidad III, duración 4 segundos.

21, 2<sup>h</sup> 43<sup>m</sup> 19<sup>s</sup> \* [21, 10<sup>h</sup> 43<sup>m</sup> 19<sup>s</sup>]. SE de Luzón. Temblor de intensidad III en Legaspi, donde se notaron al principio movimientos verticales seguidos de oscilaciones SSE-NNW; duración 8 segundos; y de intensidad II-III en Gubat donde las oscilaciones parecían tener la dirección N-S.

21, 21<sup>h</sup> 50<sup>m</sup> 26<sup>s</sup> \* [22, 5<sup>h</sup> 50<sup>m</sup> 26<sup>s</sup>]. W de Luzón. Temblor de tierra sentido con intensidad IV en Baguio y II-III en Bolinao, su epicentro se hallaba cerca de la costa NE del Golfo de Lingayén.

23, 21<sup>h</sup> 09<sup>m</sup> [24, 5<sup>h</sup> 09<sup>m</sup>]. Aparri (NE de Luzón). Temblor oscilatorio, dirección E-W, intensidad III, duración 3 segundos.

25, 9<sup>h</sup> 50<sup>m</sup> [25, 17<sup>h</sup> 50<sup>m</sup>]. Cotabato (SW de Mindanao). Temblor oscilatorio, dirección E-W, intensidad III-IV, duración 3 segundos. Su epicentro se hallaba hacia el interior del distrito, puesto que según informes tuvo mayor intensidad y duración en Tamontaca y otras localidades situadas al SE y E de Cotabato.

27, 12<sup>h</sup> 51<sup>m</sup> 20<sup>s</sup> \* [27, 20<sup>h</sup> 51<sup>m</sup> 20<sup>s</sup>]. Centro de Mindanao. Temblor de tierra sentido en los distritos de Dapitan, Misamis, Lanao, Cotabato y N del Valle del Agusan. Tuvo intensidad IV-V en Dapitan donde se notaron dos repeticiones de intensidad III-IV a intervalos de 10 minutos. En Cotabato tuvo intensidad IV y II-III en Butuan. Su epicentro se hallaba probablemente al NW de la bahía Illana.

29, 17<sup>h</sup> 52<sup>m</sup> 52<sup>s</sup> \* [30, 1<sup>h</sup> 52<sup>m</sup> 52<sup>s</sup>]. Dapitan y Cotabato. Temblor de tierra de intensidad IV en Dapitan y II-III en Cotabato. Éste fué sin duda una repetición del precedente, originada en el mismo centro.

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.

29, 18<sup>h</sup> 57<sup>m</sup> 36<sup>s</sup> \* [30, 2<sup>h</sup> 57<sup>m</sup> 36<sup>s</sup>]. Legaspi (SE de Luzón). Temblor oscilatorio, dirección S-N, intensidad III, duración 10 segundos.

GRAN TERREMOTO DE SIAO, SANGIR, TALAUT Y MINDANAO.

El día 14 a 8<sup>h</sup> 47<sup>m</sup> 38<sup>s</sup> [14, 16<sup>h</sup> 47<sup>m</sup> 38<sup>s</sup>] los seismógrafos de Manila y de Baguio y sucesivamente los de los otros observatorios de todo el mundo registraron un terremoto lejano muy característico tanto por su duración como por la amplitud de los registros. Como solo se recibieron en Manila avisos telegráficos de haberse sentido débilmente en algunas estaciones de Sámar y Leyte, se creyó que el epicentro se hallaba en el Mar Pacífico, bastante distante hacia el E o SE. Poco después el correo trajo noticias alarmantes de la parte E y SE de Mindanao, donde el terremoto se había sentido con violenta intensidad y una duración extraordinaria. Como en la región de su mayor violencia, al rededor del seno de Davao y en la isla Sarangani, solamente se observaron ondulaciones horizontales de grande amplitud y relativamente lentas, dedujimos que el verdadero epicentro debía estar fuera de la isla de Mindanao hacia el SE o S. Por fin un recorte del "Evening News" del 1.º de Abril de Sydney que contenía información telegráfica recibida de Amsterdam nos dió a conocer su verdadero origen. Decía así el recorte:

AMSTERDAM.—Acaban de llegar noticias de que el 14 de Marzo se sintió un severo terremoto en las Indias Orientales holandesas. Las islas de Sangir, Siao y Talaut al NE de Celebes sufrieron grandemente, muchos pueblos fueron destruídos. Ciento siete personas, según se dice, quedaron enterradas bajo las ruínas.

Según esto el epicentro de este terremoto se hallaba cerca de las islas citadas o tal vez entre ellas y el extremo S de Mindanao: entre los meridianos 125° y 127° E y los paralelos 3° y 5° N.

Fué sin duda uno de los más grandes terremotos, si bien los daños causados serían relativamente pequeños por existir pocas tierras habitadas en el epicentro. A continuación resumiremos los datos que se refieren a este terremoto recibidos de Mindanao y las Visayas, con el siguiente orden:

1.º Temblores de tierra sentidos en Sarangani, a unos 200 kilómetros al NNW del epicentro, antes del terremoto del 14 y que pueden considerarse como precursores.

Día 3, 7<sup>h</sup> 15<sup>m</sup> (3, 15<sup>h</sup> 15<sup>m</sup>) intensidad IV, dirección S-N.  
 11, 0<sup>h</sup> 40<sup>m</sup> (11, 8<sup>h</sup> 40<sup>m</sup>) intensidad III, dirección S-N.  
 12, 9<sup>h</sup> 47<sup>m</sup> (12, 17<sup>h</sup> 47<sup>m</sup>) intensidad IV, dirección S-N.  
 14, 1<sup>h</sup> 00<sup>m</sup> (14, 9<sup>h</sup> 00<sup>m</sup>) intensidad IV.  
 14, 8<sup>h</sup> 00<sup>m</sup> (14, 16<sup>h</sup> 00<sup>m</sup>) intensidad IV.

2.º Resumen de los reports del gran terremoto del 14 a 8<sup>h</sup> 47<sup>m</sup> 38<sup>s</sup> [16<sup>h</sup> 47<sup>m</sup> 38<sup>s</sup>], correspondientes a Sarangani y Mindanao.

Terremoto violento, dirección S-N: fué un doble terremoto, duración 25 segundos. Cortó las cabezas de muchos árboles e hizo caer postes. Durante la noche siguiente hubo una continuación de choques ligeros. (W. S. Coe, Sarangani.)

Este terremoto merece ser considerado como muy fuerte y duradero. Desde el primer instante observé unas oscilaciones de tierra y movimientos tan visibles de la iglesia y convento, que considero como una maravilla el que no se viniesen al suelo. No pudiéndome tener en pie me arrodillé, pero ni así pude sostenerme y me eché al suelo, hasta que terminaron los vaivenes, que a mi parecer duraron sobre dos minutos. Según mi sensación el terremoto fué puramente oscilatorio, sin choques verticales, debiéndose a esto que no causase más desperfectos. En el convento e iglesia quedaron destrozados varios tabiques; en el pueblo las casas de nipa bamboleaban mucho, y algunas quedaron inclinadas. En todas se rompió vajilla y otros objetos. Me dicen que se abrieron grietas en el suelo en algunos sitios de la población. (R. P. R. Peruga, S. J., Davao.)

Temblor violentísimo de SE-NW, que duró de 4 a 5 minutos. Antes de los primeros movimientos hubo ruidos subterráneos procedentes del SE durante 2 segundos. Se pararon los relojes, se cayeron botellas y otros objetos en las casas, tocaron las campanas, se derrumbaron tabiques, cayendo los escombros hacia el SE, y se abrieron grietas de las que salía agua y arena fina. (D. L. García, observador, Davao.)

El terremoto del 14 fué el más violento sentido en el distrito de Umayan durante los dos últimos años. La parte más fuerte del terremoto duró dos minutos y treinta y cinco segundos. No conozco el medio de calcular la intensidad del terremoto si no es por la excitación causada en el pueblo. Los manobos estaban considerablemente aterrorizados. No quedó después efecto ninguno, sino algunos árboles tumbados y rotos por el terremoto. Esto sin embargo sucede con frecuencia en esta región; cualquier terremoto causa la caída de grandes árboles, debido tal vez a estar la tierra empapada en agua durante la época de lluvias. (D. H. Malone, Distrito de Umayan, S del Valle de Agusan.)

Temblor muy fuerte, duración un minuto y cincuenta y ocho segundos. En los días siguientes se han sentido tres más, pero de poca intensidad. (R. P. J. Garriga, S. J., Baganga.)

Estaba en la iglesia predicando, viendo que las sacudidas duraban mucho nos salimos todos; yo me fuí a la huerta, pensando que todo se vendría abajo. Todo rodaba por el suelo y los maderos de las casas crujían terriblemente. No pude precisar bien la duración, pero me pareció que fué más de dos minutos. (R. P. Chr. Sastre, S. J., Talacogon.)

El terremoto del 14 fué el más fuerte que he sentido durante los tres años que estoy en Filipinas. Gracias a Dios no causó desperfectos en mi pueblo, sólo las pequeñas campanas tocaron durante el terremoto. Su duración fué de unos dos minutos. (R. P. Walter, Panis, Tandag.)

Hubo tres series distintas de oscilaciones muy fuertes y en la dirección SSE-NNW. Las sintió todo el vecindario tanto los que se hallaban en las casas como los que andaban por la calle. Hubo paradas de relojes, caída de los objetos en las casas y principalmente en las tiendas de los chinos. Su duración fué de unos cuatro minutos. (D. Patricio Yabao, observador, Cotabato.)

Temblor muy fuerte, dirección SSE-NNW, duración más de dos minutos. Por razón de su intensidad fué uno de tantos como se sienten aquí, pero es único por su larga duración. La gente que estaba en la iglesia se aterrorizó y echó a llorar y huir al notar que su duración pasaba de la ordinaria y al oír que se caían algunos objetos. No hubo desperfectos en las casas. Las aguas del río se agitaron mucho y se movían de E-W, de orilla a orilla, y las embarcaciones se balanceaban fuertemente. Es opinión mía y de los demás que este temblor sólo puede calificarse de muy fuerte a causa de su larguísima duración.

De los vecinos pueblos de Cabarbarán y Jabonga me dicen que allí el terremoto se sintió como aquí en Butuan, siendo también extraordinaria su duración de más de dos minutos. Supe de unos banqueros que se hallaban en el mar, navegando cerca de Surigao, que lo sintieron mucho y que se levantaron olas.

Unos agricultores que estaban plantando palay en un terreno bajo que está a unas 6 millas al N de aquí dicen que, los vaivenes eran tan fuertes y visibles que apenas podían tenerse en pie; parecían proceder de hacia el S. El terreno, que antes sólo estaba humedecido, quedó en varias partes cubierto de agua. (D. Generoso Copin, observador, Butuan.)

El terremoto del 14 no causó desperfectos en este pueblo; fué remarcable por su duración pero no por su violencia. Se notaron largas y lentas ondulaciones. (R. P. Jos. Menken, Cantilan.)

Las notas de Zamboanga, Dapitan y Cagayán indican que en toda la isla de Mindanao el terremoto tuvo una duración extraordinaria. Fué también perceptible en las islas de Cebú, Bohol y Leyte.

Los datos precedentes nos dan una idea de la grande extensión de este terremoto. Suponiendo que el punto medio de la línea o área donde se originó se hallaba entre las islas de Sangir y Talaut, la isoseisma VIII corre por el N cerca de 500 kilómetros de distancia y fué perceptible en la misma dirección hasta Tacloban (Leyte) que dista poco menos de 900 kilómetros. El haber sido bien perceptible en toda la isla de Leyte, y en el S de Sámar, en Cebú y Bohol y no en las islas de Negros y Panay indican que los movimientos se extendieron más hacia el N que hacia el NW.

También parece deducirse de los reports arriba extractados que su intensidad fué mayor a lo largo del Valle del Agusan que en Cotabato y en las costas orientales de Mindanao. Nos parece por consiguiente muy probable que el hypocentro de este terremoto era una línea o fractura en dirección N-S, la cual posiblemente sea continuación de la línea seismotectónica del Agusan y del Golfo de Davao que discutimos en el "Monthly Bulletin of the Weather Bureau for August, 1910."

Son dignos de consideración en primer término la gran duración de este terremoto, en toda la isla de Mindanao encerrada dentro de la isoseisma V; ningún report le da menos de dos minutos. En segundo lugar el carácter amplio pero no súbito y violento de las ondulaciones, aun en Davao y Sarangani donde pueden calificar de intensidad VIII-IX.

3.º Repeticiones o *aftershocks* perceptibles en Sarangani y en la parte SE de Mindanao:

- 15, 7<sup>h</sup> 50<sup>m</sup> [15, 15<sup>h</sup> 50<sup>m</sup>]. Sarangani. Repetición de intensidad IV.
- 16, 6<sup>h</sup> 18<sup>m</sup> 28<sup>s</sup>\* [16, 14<sup>h</sup> 18<sup>m</sup> 28<sup>s</sup>]. Sarangani y Davao, V.
- 17, 6<sup>h</sup> 15<sup>m</sup> [17, 14<sup>h</sup> 15<sup>m</sup>]. Sarangani, IV.
- 21, 3<sup>h</sup> 16<sup>m</sup> [21, 11<sup>h</sup> 16<sup>m</sup>]. Sarangani y Davao, IV.
- 24, 4<sup>h</sup> 50<sup>m</sup> [24, 12<sup>h</sup> 50<sup>m</sup>]. Sarangani, III.
- 27, 1<sup>h</sup> 40<sup>m</sup> [27, 9<sup>h</sup> 40<sup>m</sup>]. Sarangani, III.

Como los datos que preceden comprenden solamente la isla de Mindanao encerrada en un pequeño sector del N del epicentro de este terremoto, sin que hasta la fecha hayan llegado a nuestras manos más noticias sobre su extensión e intensidad en las otras direcciones, nos abstenemos por ahora de trazar mapa sísmico alguno, y de apuntar la probable conexión que este terremoto haya podido tener con la gran Fosa Filipina, cuyo borde SW probablemente caía dentro del área meizoséismica.

No dejaremos sin embargo de adelantar que desde el 17 al 30 del mes de Abril siguiente en la Península de Surigao y parte del N del Valle del Agusan unos 500 kilómetros al N del epicentro del 14 se estuvieron repitiendo gran número de terremotos, contándose algunos días más de 30 de variable intensidad entre los grados III y VII-VIII de la escala Rossi-Forel.







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## BULLETIN FOR APRIL, 1913.



# METEOROLOGICAL BULLETIN FOR APRIL, 1913.

By Rev. JOSÉ CORONAS, S. J.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

**Pressure and temperature.**—Notwithstanding the fact that there was no typhoon or depression in the Philippines during the month, the mean atmospheric pressure was considerably lower than that during April of last year, the difference in almost all parts being greater than  $-1.50$  mm. The highest pressures were registered in almost all the stations on the 1st and 14th, the lowest on the 30th.

The mean temperature of the month was generally somewhat less than in April, 1912, the greatest differences being  $-1.2^{\circ}$  and  $-1.3^{\circ}$  C. in the stations of Iloilo, and San Isidro, Nueva Ecija, respectively. The extreme temperatures in Manila were  $35.2^{\circ}$  C. registered on the 10th and 14th, and  $17.2^{\circ}$  C. registered on the 2d.

PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR APRIL, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from April, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from April, 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		°C.	°C.	°C.		°C.	
Tagbilaran	758.63		759.83	14	756.97	30	26.5		33.8	22	20.5	2
Surigao <sup>a</sup>	58.63		59.99	13	56.93	30	26.1		31.5	16		
Cebu	58.72	-1.36	59.86	14	57.19	30	27.6	-0.5	32.1	30	24	5, 9
Iloilo	58.32	-1.56	59.53	14	56.78	30	27.3	-1.2	33	7	22.3	6
Ormoc	58.80	-1.59	59.84	14	57.26	30	26.7	-1	34.1	22	19.8	9
Tacloban	59.09	-1.57	60.25	14	57.39	30	26.7	-1.5	33.8	1	22	8, 9
Capiz	58.90	-1.62	59.85	1	57.58	30	26.9	-1.8	33.3	30	22	9, 16
Calbayog	58.97	-1.67	59.93	14	57.38	30	26	-2	34.6	23	20	9
Legaspi	59.29	-1.69	60.50	1	57.68	30	27.4	-1.7	33.7	11	21	4
Atimonan	59.15	-1.82	60.38	1	57.78	30	27	-1.7	32.4	24	19.6	6
Ambulong, Tanauan	58.63		59.80	1	56.99	30	27.4		35.5	8	18.7	6
Paracale	59.57	-1.73	60.84	1	58.07	30	26.6	-1.8	32.4	17	20.1	6
Manila	59.07	-1.56	60.12	1	57.47	30	27.1	-1.9	35.2	10, 14	17.2	2
San Isidro	59.23	-1.57	60.39	1	57.68	30	27.6	-1.3	37.1	8	17.5	2
Dagupan	58.39	-1.67	59.47	1	56.90	30	28.2	-1.7	37.8	14, 17	20.5	2
Bolinao	58.61	-1.64	59.78	1	57.08	30	28.4	-1.6	36.1	23	22.6	20
Baguio <sup>b</sup>	636.79	-1.38	637.61	1	635.66	30	18.6	-1.7	27	17	14.1	4
Vigan	758.68	-1.70	759.88	1	757.33	30	28.1	-2	34.9	27	21.5	3
Tuguegarao	59.27	-1.70	60.55	1	57.74	30	28.2	-1.4	39.4	17	19.4	2
Aparri	59.22	-1.70	60.42	18	57.53	30	26.7	+1.2	33.6	23	20.6	17

<sup>a</sup>26 days of observation only.

<sup>b</sup>The barometric readings of this station are not reduced to sea level.

**Rainfall.**—As may be seen from the following table, all but seven of the stations had a greater rainfall than during the corresponding month of last year, and compared with the normal for the month of April the majority of them had positive differences. In Manila the amount of rain was 130.4 mm., which is greater than the normal of the month by 96.2 mm. and greater than that of April, 1912, by 129.6 mm.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF APRIL, 1913.

Station.	Total.	Departure from April, 1912.	Departure from normal.	Rainy days.	Departure from April, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from April, 1912.	Departure from normal.	Rainy days.	Departure from April, 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.			mm.			mm.	mm.	mm.			mm.	
Jolo	126.6		+ 17	8		34.7	15	Calapan	121.2	+ 53.7		14	+ 3	37.8	13
Isabela, Basilan	50.4	+ 18.1		10	+ 3	18.3	20	Virac	272.6	+ 151.9		19	+ 4	73.4	13
Zamboanga	26.9		+ 5.8	8	+ 4	8.1	16	Nueva Caceres	55.1	+ 42.6	- 46.7	8	+ 4	30.2	17
Davao	155.6	- 112.9	+ 30.6	15	+ 6	23.4	16	Batangas	57.7	+ 57.7		7	+ 7	17.5	18
Cotabato	188.1	+ 47.2	+ 23.2	18	+ 4	36.1	16	Atimonan	100.4	+ 90.4	+ 8.3	10	+ 2	37.9	18
Cagayan, Misamis	38.6	+ 28.9		8	+ 5	21.6	15	Ambulong, Tanauan	74.1			6		46.4	18
Butuan	242.2	+ 144.6	+ 120.2	22	+ 5	39.4	28	Silang	65.1	+ 51.9		7	+ 2	36.5	15
Dumaguete	26.1	+ 25.6		11	+ 10	7.9	14	Paracale	128.5	+ 95.9		14	+ 4	33.3	11
Yap, W. Carolines	227.5	+ 148.2		22	+ 4	58.2	9	Sta. Cruz, Laguna	55.8	+ 46.7		12	+ 6	33	14
Tagbilaran	35.3		- 159.4	10		8.6	23	Manila	130.4	+ 129.6	+ 96.2	5	+ 4	48.3	14
Surigao <sup>a</sup>	451.6							Antipolo	45.7	+ 39.3		4	+ 1	29.5	19
Maasin	76.3	+ 31.9	+ 11	8	+ 4	15.2	4	Iba	78.8	+ 54.9		8	+ 6	70.4	15
Cebu	13.7	+ 11.4	+ 19.2	11	+ 8	2.8	15	San Isidro	73	+ 60.3	+ 38.1	5	+ 4	39.9	14
Iloilo	89.6	+ 85	+ 45.9	10	+ 9	39.7	12	Tarlac	112.2	+ 63.2	+ 41.2	5	+ 2	52.8	14
San Jose Buenavista	41.8	+ 32.1		6	+ 3	26.4	21	Baler	370.2	+ 221.3		19	+ 2	104.4	14
Cuyo	27.2	+ 19.5		4	+ 2	20.6	16	Dagupan	149.4	+ 138.9	+ 76.6	4	+ 1	81.3	17
Ormoc	62.3	+ 27.8	+ 3.5	9	+ 1	39.9	11	Bolinao	39.4	+ 35.6	+ 10.1	4	+ 3	27.2	17
Tacloban	211.2	+ 89.8		21	+ 8	72.9	11	Baguio	91	+ 83	- 25.3	5	0	49.8	17
Capiz	40	+ 31.6	+ 13.9	12	+ 9	13.8	15	San Fernando, Union	23.9	+ 16.3	+ 6	3	+ 1	18.8	17
Borongan	366.6	+ 214.5	+ 116.4	25	+ 6	101.1	12	Echague	8.7	+ 3.8		4	0	7.6	18
Calbayog	117.1	+ 4.9	+ 9.2	15	+ 6	44.7	11	Candon	8.2	+ 8.2		2	+ 2	6.9	26
Masbate	84.9	+ 75.7		7	+ 4	46.7	12	Vigan	5.5	+ 5	- 19.3	1	+ 1	5	25
Romblon	62.2	+ 45.6		15	+ 9	18	18	Tuguegarao	25.2	+ 17.8	- 41.8	2	0	23.9	18
Batag	117.5			11		26.4	11	Laoag	0			0		0	0
Gubat	79.9	+ 8.2		16	+ 4	19.1	14	Aparri	51.3	+ 23.7	+ 8.8	4	+ 2	29.7	18
Legaspi	182.3	+ 76.7	+ 11.3	21	+ 10	31.5	12	Sto. Domingo, Batanes	125.1	+ 44.6		5	+ 5	59.7	3
Sumay, Guam	17.8	+ 11.3		7	+ 4	8.3	25								

<sup>a</sup> 26 days of observation only.

## DEPRESSIONS AND TYPHOONS.

As already mentioned, no depression was observed in the neighborhood of the Philippines during the month, and those which appeared on our weather maps of the whole of the Far East were so far distant from the Archipelago that their influence was scarcely noted.

## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—A pesar de no haber habido en Filipinas ninguna depresión o tifón en todo el mes, la presión atmosférica media es bastante inferior a la de Abril del año pasado siendo las diferencias casi en todas partes mayores de  $-1.50$  mm. Las presiones mayores ocurrieron casi en todas las estaciones los días 1 y 14, y las menores tuvieron lugar sin excepción el día 30.

La temperatura media mensual es en general algo más baja que la de Abril, 1912, siendo las diferencias mayores  $-1.2^{\circ}$  y  $-1.3^{\circ}$  C. correspondientes a las estaciones de Iloilo y San Isidro, Nueva Écija, respectivamente. Las temperaturas extremas para Manila fueron  $35.2^{\circ}$  C. registrada los días 10 y 14, y  $17.2^{\circ}$  C. registrada el día 2.

**Precipitación acuosa.**—Según se ve en la tabla que acompaña el texto inglés, todas las estaciones a excepción solamente de siete dan este mes un total de lluvia mayor que el del año pasado. Comparando además los mismos totales con los valores normales de Abril, resulta también una notable mayoría con diferencias positivas. En Manila se recogieron en todo el mes 130.4 mm. de agua, cantidad mayor que la normal de este mes en 96.2 mm., y que la de Abril, 1912, en 129.6 mm.

## DEPRESIONES Y TIFONES.

Como queda ya indicado arriba, no se ha observado en todo este mes depresión alguna en las cercanías de Filipinas, y aún las que aparecen en nuestros mapas del tiempo en toda la extensión del Extremo Oriente, han corrido a tanta distancia de nuestro Archipiélago que apenas se pudo notar en él su influencia.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.			Free expo- sure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.				
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.
1.	760.12	27	34	20.6	29.3	31.8	29.9	30.2	28.7	28.5	64.1	16.4	8.3	6.3
2.	59.50	25.5	33.6	17.2	28.9	31.6	30	30.3	28.7	28.3	64.1	15.2	7.1	5.1
3.	59.20	25.8	33.4	19	29.3	31.6	30	30.3	28.7	28.4	64.8	15.8	6.3	4.6
4.	59.80	26.1	33.7	18.7	29.4	31.4	30.1	30.2	28.7	28.4	61.8	15.2	7.4	5.5
5.	59.76	25.8	33.2	18	28.1	30.9	29.9	29.8	28.8	28.5	61.8	14.9	7.5	5.5
6.	59.02	26.2	33.6	18.6	27.9	30.8	29.5	29.8	28.7	28.3	64.4	15.9	6.9	5
7.	58.63	27.2	35.1	20.9	28.9	31.7	29.6	29.9	28.8	28.4	67.3	17.8	7.4	4.7
8.	58.96	27.6	35	22.4	29.5	32.1	30	30.1	28.7	28.4	70.6	19	6.5	4.8
9.	59.39	26.9	34.2	20.8	29.6	31.5	30	30.3	28.7	28.4	65.5	16.9	7.2	5.3
10.	59.15	27.4	35.2	19.9	29.2	31.9	30	30.2	28.8	28.3	63.4	16.9	7.4	5.5
11.	59.01	28.5	34.7	22.7	30.5	32.5	30.4	30.6	28.9	28.4	63.5	18.1	6.9	5.6
12.	59.21	27	33.7	21.4	30.5	32.5	30.6	30.6	28.9	28.4	70.3	18.4	4.8	3.7
13.	59.35	27.8	34.7	23.6	30.5	32.5	30.6	30.6	28.9	28.3	73.7	20.3	4.9	3.6
14.	59.49	28.4	35.2	23.9	30.6	33.2	30.6	30.9	29	28.5	72.6	20.4	4.8	3.7
15.	58.86	27.2	33.2	24.2	30.4	31.8	30.8	30.8	29.1	28.5	82.7	22	2.5	2
16.	58.55	27.1	30.8	24.4	29.6	30.4	30.5	30.5	29	28.6	85.2	22.6	2.4	1.7
17.	59.04	27.7	34.1	24.8	29.5	31	30.3	30.5	29	28.5	80.6	22	3.7	2.7
18.	59.81	26.5	33	23.8	29.8	31.2	30.4	30.5	29	28.5	85.2	21.8	2.7	2.1
19.	59.75	25.4	32.6	22.4	29.5	30.7	30.3	30.4	29.1	28.6	85.8	20.5	2	2
20.	59.83	27.3	34.1	23	28.8	30.8	30.1	30.2	29.2	28.6	77.1	20.5	4.5	3.6
21.	59.75	27.7	34.2	22.8	29.5	30.5	30.1	30.3	29.2	28.7	70.2	19	5.8	4.3
22.	59.44	28	34.3	23	29.5	30.8	30.1	30.5	29.2	28.7	65.4	18.2	7.1	5.2
23.	58.71	27	33.9	21.5	29.6	30.6	30.4	30.5	29.2	28.6	66.4	17.4	5.6	4.3
24.	58.06	27.7	33.6	21.8	29.2	31.4	30.2	30.3	29.2	28.6	64.6	17.6	6.1	5
25.	58.15	27.1	33.9	22.2	29.4	30.3	30.2	30.2	29.2	28.6	68.5	18.1	5.2	4.3
26.	58.72	27.7	34.2	21.9	29.5	30.8	30	30.3	29.1	28.6	65.6	17.7	6.2	4.8
27.	58.85	27.3	33.1	21.7	29.7	31.3	30.2	30.3	29.2	28.5	68	18.1	5.2	4.8
28.	58.43	27.7	34.5	23.1	30	31.3	30.2	30.5	29.2	28.6	67.6	18.3	5.8	4.6
29.	58.11	27.5	34.4	22.5	29.9	30.8	30.3	30.3	29.2	28.6	69.3	18.6	5.9	4.5
30.	57.47	27.9	34	23.2	29.7	31.5	30.2	30.3	29.3	28.7	70.4	19.4	6.4	5
Mean	759.07	27.1	33.9	21.8	29.5	31.4	30.2	30.3	29	28.5	70	18.4	5.7	4.3
Total													170.5	129.8
Departure from normal	-0.31	-1	+0.1	-0.9							+0.3	-1		

Day.	Wind.				Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.
	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.		Form and its direction.				
						Upper.	Lower.			
		Km.	Km.		0-10.			h. m.	mm.	
1.	SE	272	29	ESE	1.6	Ci.	Fr.-Cu.	E	9 50	
2.	SE	198	19	WNW	5.9	Ci.	Cu.	E	8 30	
3.	SE quad.	195.5	20	SE by S	4.9	Ci.	Cu.	E	7 00	
4.	SE	244	20	SE	4.8	Ci.	Cu.	E	8 25	
5.	SE	222.5	17.5	SE	6.4	Ci.-S.	WSW	E	5 25	
6.	E quad.	190	16.5	WNW	7.8	Ci.-S.	NE	EbyS	6 25	
7.	SE	204	23	WNW	3.7	Ci.	Cu.	E	9 45	
8.	SE	229	19.5	SE	3.2	A.-Cu., Ci.	Cu.	E	8 40	
9.	SE	235.5	29	SE	2.8	Ci.	Cu.	E	9 50	
10.	SE	192	19	SSE	2	Ci.	Cu.	E	9 45	
11.	SE quad.	188	21	WNW	3		Cu.	E	9 20	
12.	SE, WSW	132	16	WSW	5.8	A.-Cu.	Cu.	E	5 15	☼ a. d° p.
13.	SE	187	17	NNW, NNE	7.8	Ci.	Cu.	E	5 00	☼ p.
14.	SE quad.	190	17	SE	5.9	Ci.	Cu.	SE	8 50	☼ 2 ☼ p.
15.	SSW	153	18	SSW	7.5	Ci.-S.	Cu.	E	5 05	☼ a. ☼ p.
16.	WSW	157	15	WSW	7.5	Ci.-S.	Cu.	E	2 05	☼ d° a. ☼ p.
17.	S quad.	134	14	SW	9.4	Ci.-S.	Cu.-N.	E	5 05	☼ d° p.
18.	N quad.	150	15	NNE	8.6	Ci.-S.	Cu.	ESE	4 25	☼ a. ☼ p.
19.	NE quad.	163	21	NE	7.8	Ci.	Cu.	E	5 55	☼ a. ☼ 2 p.
20.	NNE, SE	192.5	18	SSE	5.9	Ci.	Cu.	E	10 50	
21.	SE	195.5	21	SE	4.2	Ci.	Cu.	E	9 50	
22.	SE	266	25	SSE	3.7	Ci.	Cu.	E	10 15	
23.	E quad.	202.5	20	E	4.8	Ci.	Cu.	E	8 30	
24.	E quad.	259.5	26	E	3.8	Ci.	Cu.	E	10 30	
25.	ENE	180.5	23	SE	5.8	Ci.	Cu.	E	8 10	d° p.
26.	E quad.	225	24	SEbyE	5.2	Ci., Ci.-S.	Cu.	E	10 10	☼ a.
27.	ENE	212	16.5	ENE	7.2	Ci.-S.	SW	E	5 55	
28.	E quad.	203.5	18	ENE	5.5	A.-Cu.	Cu.	E	9 10	
29.	E quad.	239.5	21	WbyN	4	Ci.	Cu.	E	10 15	
30.	SSE, W	194.5	16.5	W	2.5	A.-Cu.	Cu.		10 15	
Mean		200.2	19.8		5.3				7 57	
Total		6,007.5							238 25	130.4
Departure from normal		-984.4			+1.2				-24 01	+96.2

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.



METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.<sup>a</sup>

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. et.	mm.		0-12.	0-10.				mm.	
1.	759.39	26.3	32.6	21.5	79	20	NE quad.	1.2	2.8	Ci.	Cu.	E		d° a.
2.	58.71	26.6	33.5	20.5	76.2	19.3	E	1.7	2	Ci.	Cu.	SE, E		
3.	58.71	25.7	32.2	21.4	83.8	20.2	E	1.5	3.3	Ci.	Cu.	SE		
4.	59.61	24.5	31	21.4	87.8	20	E, SE	1.7	5.7	Ci., Ci.-S.	Cu.	SSE	5.6	● a. p.
5.	59.48	25.9	31.5	21.4	80.2	19.7	E	1	4	Ci.-S.	Cu.	SE		
6.	58.71	25.8	31.8	20.8	82.7	20	SE, E	.5	4	Ci., Ci.-S.	Cu.	SE		
7.	58.64	26.5	32.2	23.3	84.3	21.6	NE, E	.7	5.2	Ci.	Cu.	E	5.1	● p.
8.	59.02	25.9	31.3	21.8	83.3	20.5	E	.8	2.8	Ci.	Cu.	E, SE		
9.	59.17	26.2	31.2	20.7	81.2	20.3	SE	1	4.8	Ci.-S.	Cu.	SSE		
10.	58.79	27	32.8	23.4	80.5	21	E quad.	.8	7.8	Ci.-S.	Cu.	SE quad.		
11.	58.44	26.3	30.4	22.7	86.8	22	E quad.	.8	7	Ci., Ci.-S.	Cu.	E	.5	p <sup>2</sup> 2 p.
12.	58.74	27.2	32.4	24.2	88.2	23.5	NE	1.2	7.3	Ci.	Cu.	SE quad.		d° 1 2 p.
13.	59.36	26.6	31.9	24.5	91.2	23.4	SSE, SE	.5	8.2	Ci.-S.	Cu.	S quad.	2.3	
14.	59.83	26.4	32.2	23	90.8	23	SE	1.8	6.2	Ci.-S.	Cu.	SSE	3.6	● a. p. ∪ p.
15.	59.22	26.6	29.7	22.7	92.3	23.1	E quad.	1.2	5.5	Ci.-S.	Cu.	SE quad.		d° p.
16.	58.62	27	30.9	23.5	85	22.4	SE	1.3	4.3	Ci.	Cu.	SSE		∪ p.
17.	59.14	27.1	30.8	23.7	86.7	23	SE	.7	7.2	Ci.-S.	Cu.	SSE		● 1° a.
18.	59.34	26.4	30.4	23	87.7	22.4	SE, E	.8	5.2	Ci.-S., Ci.	Cu.	SSE	4.3	
19.	59	26.9	33	22.1	81.7	21.3	SE	1.5	2.5	Ci.	Cu.	SSE		
20.	59.47	26.9	32.3	22.9	81.2	21	E	1.2	4	A.-Cu.	Cu.	SE		∩ p.
21.	59.40	27	33.2	23.1	81.7	21.3	SE, E	1	3.3	A.-Cu.	Cu.	SE	1.3	p <sup>2</sup> a.
22.	59.05	27	33.8	22	80.5	20.8	SE	1.7	2.3	Ci.	Cu.	SSE		
23.	58.06	25.7	32.6	21.3	85.2	20.7	E	1	4.2	Ci.	Cu.	ESE	8.6	● a. d° p.
24.	57.01	27.2	33.3	23.4	75	19.8	Variable	1.3	2.3	Ci.	Cu.	SE		
25.	57.32	27	32.8	23	80.2	21.1	SE	1	3.7	Ci.	Cu.	SSE	.5	
26.	57.79	26.7	33.6	23.5	86.7	22.5	SE	.5	7.5	Ci.-S.	Cu.	SSE		●° a.
27.	57.59	26.2	32.7	23.3	82.2	20.6	SE	1.3	4.7	Ci.-S., Ci.	Cu.	SSE	2	p <sup>2</sup> p.
28.	57.19	26.3	30.2	23.1	88.3	22.3	E, SE	1	4.2	Ci.	Cu.	E, SE	1.5	●° p.
29.	57.20	27.1	32.3	23.6	85.2	22.5	SE	.8	4.3	Ci.-S., Ci.	Cu.	SE quad.		d° a.
30.	56.97	27.1	33.1	23.8	83.3	22	SE	1.2	5.5	Ci.-S.	Cu.	SSE		
Mean	758.63	26.5	32.1	22.6	84	21.4		1.1	4.7					
Total													35.3	

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1															
2															
3															
4															
5	759.32	25	30.6	21.6	86.3	20.3	NNW	194.9	5.5	Ci.-S.	Cu.-N.	NE	6.1	● p.	
6	58.98	25.9	29.9	21.7	85.7	21.1	ENE	193.1	4.3	Ci.-S.	Cu.-N.	NE	7.1		
7	58.80	25.6	28.8	23	85.5	20.8	ENE	226.6	8	Ci.-S.	N.	NE	3.3	● a.	
8	59.16	25.9	31.4	21.4	82.7	20.3	ENE	162.1	4.5	Ci.-S.	Cu.-N.	NE			
9	59.18	25.6	31	22.5	85.7	20.8	NNW	191.3	7.3	Ci.-S.	Cu.-N.	NE	69.8	● p.	
10	58.54	24.3	25.6	22.8	91.2	20.6	NNE	141.4	10	Ci.-S.	N.	NE	80.5	● <sup>2</sup> a. ● p.	
11	58.38	25	26.7	23.5	92.2	21.6	NNW	219	10	Ci.-S.	N., Fr.-N.	NE	54.5	● <sup>2</sup> a. p.	
12	58.96	25.9	28.2	23.5	89.5	22.2	NNW	107.9	9.3	Ci.-S.	Fr.-N.	NE	2.8	d a.   <sup>2</sup> ● p.	
13	59.99	26.2	29.1	23.6	86.8	22	ENE	188.7	6	Ci.-S.	Cu.-N.	NE			
14	59.83	26.8	30.1	24	85.8	22.4	ENE	206.3	5	Ci.-S.	Cu.-N.	ESE			
15	59	26.6	30.2	23.7	85.8	22.2	ENE	191.1	6	Ci.-S.	Cu.	ESE		<sup>2</sup> p.	
16	58.25	27.1	31.5	23	85	22.5	ENE	218.2	4.7	Ci.-S.	Cu.	ESE		<sup>2</sup> p.	
17	58.89	27	30.7	23.7	84.5	22.3	ENE	227.2	5.7	Ci.-S.	Cu.-N.	ESE			
18	59.34	27	31.3	22.6	85.2	22.4	ENE	221.3	5.7	Ci.-S.	Cu.-N.	ESE			
19	59.14	26.5	30.3	23.4	86	22.1	EbyN	179.1	7.2	Ci.-S.	Cu.-N.	ESE	6	d a. ● <sup>2</sup> p.	
20	59.45	26.4	30.3	22.4	86	22	ESE	208.4	6.2	Ci.-S.	Cu.-N.	SSE	11.2	d a.	
21	59.62	25.6	29.4	23.6	89.5	21.8	ESE	171.1	7.8	Ci.-S.	Cu.-N.	SE	5.6	● a. p.	
22	59.34	26.2	29.9	22.8	86.2	21.7	ENE	241.5	7.2	Ci.-S.	Cu.-N.	SE	13.2	d p.	
23	58.18	25.9	28.6	23.7	88.8	22	E quad.	286.8	9.8	Ci.-S.	Fr.-N.	SE	26.9	● a. p.	
24	57.35	27	31	24.2	84.2	22.2	ENE	283.9	6.3	Ci.-S.	Cu.-N.	SE	10.7	● p.	
25	57.66	25.4	30	23.2	88.5	21.3	ENE	224.5	7.7	Ci.-S.	N.	SE	86.8	● <sup>2</sup> a. ● <sup>2</sup> p.	
26	57.77	25.3	29.1	22.7	90.2	21.5	ENE, E	194	10	Ci.-S.	Fr.-N.	SE	29.2	● <sup>2</sup> a. ● p.	
27	57.40	25.8	29.3	23	88.5	21.8	ENE	250.8	9.5	Ci.-S.	Fr.-N.	ESE	20.4	● a. p.	
28	57.38	26.2	30.7	23.5	87.8	22.1	E quad.	167.9	8.5	Ci.-S.	NE	ESE	7.9	● a. p.	
29	57.44	27.4	30.5	24.3	82	22.1	ENE	312.5	5.8	Ci.-S.	NE	ESE	9.6	● p.	
30	56.93	27.6	31	23.9	82.7	22.6	ENE	234.2	7	Ci.-S.	NE	ESE			
Mean	758.63	26.1	29.8	23.1	86.6	21.7		209.5	7.1						
Total													451.6 <sup>b</sup>		

<sup>a</sup> All the mean values given in these tables are deduced from six daily observations.<sup>b</sup> 26 days of observation only.

## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	$^{\circ}C$ .	$^{\circ}C$ .	$^{\circ}C$ .	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	759.57	27.3	30.6	24.6	69.5	18.6	NE	455	1.2	Ci.	Cu. ENE	mm.
2.	58.84	27.5	30.1	24.3	66.7	18	NE	388.2	.7	Ci.	Cu.	mm.
3.	58.81	27.6	30.5	25.5	66.7	18.2	NE	346.4	3.8	Ci., Ci.-S.	Cu.-N. NE	mm.
4.	59.63	26.7	29.5	24.4	70.7	18.3	NE quad.	372.6	3.3	Ci.-S.	Cu.-N. ENE	mm.
5.	59.39	27	30.6	24	65.7	17.3	NE quad.	322.1	4	Ci.-S.	Cu. ENE	mm.
6.	58.84	27	30	24.5	74	19.5	NE	318.7	5.3	Ci.	Cu. ENE	0.3
7.	58.63	27.4	30	24.6	72.8	19.6	NE quad.	338.3	2.3	Ci.-S.	Cu.	mm.
8.	59.04	27.3	29.8	24.9	70	18.7	NE	304.8	2.8	Ci.	Cu.-N. ENE	mm.
9.	59.15	27.3	31.1	24	72.7	19.5	N quad.	293.8	3	Ci.	Cu.	mm.
10.	58.81	27.2	29	25.5	69.5	18.6	NE	312.4	6.8	Ci., Ci.-S.	N. ENE	mm.
11.	58.31	28.1	31.4	25	70.3	19.9	NE quad.	275.7	5	A.-Cu.	Cu.-N. N	mm.
12.	58.72	27	31.1	24.7	79.2	21.1	NE	229.4	6.8	Ci.-S.	Cu.-N.	mm.
13.	59.62	27	29	25	82.5	21.8	NE quad.	246	9.3	Ci.-S., A.-Cu.	N. ENE	mm.
14.	59.86	27.6	31.5	25	79.3	21.7	N, NE	214.4	8	Ci.-S.	Cu.-N. ESE, ENE	mm.
15.	59.15	27.1	31.1	25.5	80.2	21.3	N	169.8	7.5	Ci.-S.	Cu.-N.	mm.
16.	58.56	28.2	31.5	25.6	75.8	21.4	NE quad.	230.1	5.2	Ci.	Cu. E	mm.
17.	59.14	27.9	30.2	25.6	73.5	20.5	NE	293.5	7.2	Ci.-S.	Cu. E	mm.
18.	59.64	28.2	31.3	26	71.7	20.2	NNE	329.4	4.5	Ci.	Cu. E	mm.
19.	59.21	27.8	31.2	24.6	71	19.6	NE	331.2	3.2	Ci.	Cu. E	mm.
20.	59.50	27.9	31	25.5	72.3	20.1	NE	378.6	3.7	Ci.	Cu. E	mm.
21.	59.33	27.5	29.8	25.7	75.5	20.5	N, NE	390.5	4	Ci.	Cu. E	mm.
22.	59.14	27.7	31	24.8	73.2	20.1	NE	381.3	2.5	Ci.	Cu. E	mm.
23.	58.19	28	30.7	25.5	72.2	20.1	NE	511.7	5.5	Ci.	Cu. E	mm.
24.	57.34	28.2	31	25.6	67.8	19.2	NE	522	3	Ci.	Cu. E	mm.
25.	57.57	28.1	31	25.5	72	20.2	NE	416.3	4.3	Ci.	Cu.-N. E	mm.
26.	57.91	27.8	30.1	24.9	72.2	19.9	NE quad.	378.4	5	Variable	Cu. E	mm.
27.	57.76	27.6	31	25.3	74.5	20.3	NE	436.2	5.7	Ci.-S.	Cu., Cu.-N. E	mm.
28.	57.44	27.9	31.4	25.3	73.2	20.3	N, NE	389.2	4.2	Variable	Cu. E	mm.
29.	57.33	28.5	31.5	25.3	69	19.8	N, NE	420.2	4.2	Ci.	Cu. E	mm.
30.	57.19	28.3	32.1	25.3	68	19.2	N, NE	326.9	3.5	Ci., Ci.-S.	Cu. ENE	mm.
Mean	758.72	27.6	30.7	25.1	72.4	19.8		344.1	4.5			
Total								10,323.1				13.7

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	$^{\circ}C$ .	$^{\circ}C$ .	$^{\circ}C$ .	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	759.12	27.1	32.1	23	68.2	17.7	N, NE	511.7	3.3	Ci.	Cu.	mm.
2.	58.42	27.4	32.2	23.8	65.5	17.2	NE quad.	466.5	3.3	Ci.	Cu.	mm.
3.	58.40	26.6	31.5	23	67.5	17	N, NE	453.8	5.3	Ci.	Cu.	mm.
4.	58.98	27	32	23	66.2	17.2	N, NE	484.8	4.7	Ci.	Cu.	mm.
5.	59.12	26.3	29.6	22.8	68.5	17.2	N, NE	462.9	6.5	Ci.	Cu.	mm.
6.	58.36	26.6	31.7	22.3	67.7	17.4	NE	371.9	6	Ci.	Cu.	mm.
7.	58.16	27.9	33	24.1	67	18.4	NE	343.4	5.5	A.-Cu.	Cu.	mm.
8.	58.53	27.4	31.6	24	66.7	17.8	NE quad.	369.6	3.8	Ci.-S.	Cu.	mm.
9.	58.74	26.9	31.8	22.7	65.2	17	NE quad.	437.6	3.2	Ci.	Cu.	mm.
10.	58.73	26	30.1	23.7	77.8	19.3	NE quad.	348.2	6.2	Ci.-S.	Cu., Cu.-N. NE	mm.
11.	58.24	27.4	31.8	23.8	71	19.1	N	421.3	5.8	Ci., Ci.-S.	Cu.	mm.
12.	58.42	27.1	32.5	23.7	79.5	20.8	NE	269	7.8	Ci.	Cu.	mm.
13.	59.07	26.9	31	24.4	82.2	21.6	N	114.4	8.8	Ci.-S.	Cu.-N. NE	mm.
14.	59.53	26.6	31.8	24	82.7	21.1	NE	145.8	9	Ci.-S.	Cu.	mm.
15.	58.95	25.2	32.2	23.5	86.8	20.8	NE	168.9	8.2	Ci.	Cu.-N., Cu.	mm.
16.	58.30	26.7	31.4	22.8	81	20.8	NE	197.4	6.2	Ci.	Cu.	mm.
17.	58.84	26.8	32	23.5	82.3	21.2	E	183.4	9	Ci.-S.	Cu.	mm.
18.	59.32	26.6	32	23.1	81.3	21	N	174.1	7.5	Ci.-S.	Cu.	mm.
19.	58.72	28	32.3	24.2	72	19.8	NE	359.1	7.3	Ci.	Cu.	mm.
20.	59	28.1	32	24.3	71.2	19.8	NE	375.4	5.5	Ci.	Cu.	mm.
21.	58.96	27.9	31.6	24.3	75.7	20.9	N, NE	430.5	6.2	Ci.	Cu.	mm.
22.	58.63	28.2	32	25.3	68.3	19.2	N, NE	488.8	4.3	Ci.	Cu.	mm.
23.	57.66	28	31.6	24.8	73	20.1	N, NE	532.9	3	Ci.	Cu.	mm.
24.	56.92	28.1	31.7	24.6	70	19.4	N, NE	516.5	2	Ci.	Cu.	mm.
25.	56.97	28.2	31.5	24.5	73.5	20.5	N, NE	495.8	3.2	Ci.	Cu.	mm.
26.	57.41	28.2	32.2	24.5	68.5	19	N, NE	535.3	4.5	Ci.	Cu.	mm.
27.	57.35	28.2	32.2	24.5	70.2	19.4	N	549.1	5.7	Ci.	Cu.	mm.
28.	56.96	27.9	32.4	24.5	77.3	21.2	NE quad.	462.9	6.5	Ci., Ci.-S.	Cu.-N. NE	mm.
29.	56.99	28.2	32.4	25.5	74.7	20.9	N, NE	496.5	8.2	Ci.-S.	Cu.	mm.
30.	56.78	28.1	32.3	25.1	71.8	19.9	N, NE	488.5	4.7	Ci.	Cu.	mm.
Mean	758.32	27.3	31.8	23.9	73.1	19.4		388.5	5.7			
Total								11,656				89.6

**ORMOC.**

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
1.	759.56	27.1	33.1	21.6	70	17.9	NE quad.	0-10.	3.8	Gi.		Cu.	E	mm.	Ω a.
2.	58.83	27.1	32.9	21.8	68	18	Variable	180	5	Gi.		Cu.	E		
3.	58.81	27.2	31.3	22.4	65	17.2	NE quad.	196.3	7	A.-Cu.	E	Cu.-N.	NNE		
4.	59.58	25.4	29.2	21.9	75	18.7	SE, NE	175.7	6.8	Ci.-S.		Cu.-N.	ENE	5.1	d p.
5.	59.62	24.8	31	20	82.3	18.3	Variable	149.8	9	Ci.-S.		Cu.-N.	ENE	2.3	p d p.
6.	58.95	25.6	29.9	21.2	81.2	19.7	NW, NE	123.7	9.2	Ci.-S.		Cu.-N.	E		Ω a. p p.
7.	58.58	26.7	32.8	21.1	78.2	18.6	E quad.	188.8	6.5	Ci.-S.		Cu.-N.	E		
8.	59.07	26.4	31.1	20.2	72.7	18.3	E quad.	201.3	4.2	Ci.		Cu.	E		Ω a.
9.	59.28	25.1	30.7	19.8	82.7	19.4	Variable	151.6	5	A.-Cu.	ESE	Cu.-N.	E	2.3	Ω a. d p.
10.	58.88	25.8	29.6	21.4	81.2	19.8	N	101.6	7.2	Ci.-S.		Cu.-N.			Ω a. ∩ p.
11.	58.54	25.5	29.7	23.4	89	21.5	SW	102	8	Ci.-S.		Cu.-N.	NE	39.9	Ω a. T 2 p.
12.	58.74	26.4	29.8	22.7	85.3	21.7	Variable	95.2	8.5	Ci.-S.		S.-Cu.	E		Ω a. ∩ p.
13.	59.66	26.2	32.3	23.3	85	21.1	S	126	9.2	Ci.-S.		Cu.-N.		2.8	Ω a. ∩ p.
14.	59.84	27.1	31.8	23.4	81.2	21.4	E quad.		8.3	A.-Cu.	E	Cu.-N.	E		Ω a. ∩ p.
15.	59.22	26	30.8	22.5	86	21.1	NW, N	115.6	7.5	A.-Cu.	E	Cu.-N.	SE	.3	Ω a. ∩ d ∩ p.
16.	58.54	26.9	31.6	21.9	82.2	21.4	NW, SE	138.1	5.2	Ci.	WSW	Cu.-N.			Ω a. ∩ p.
17.	59.19	27.5	32.3	23.3	77	20.8	NE, E	174.3	8	A.-Cu.	ESE	Cu.-N.			Ω a. ∩ p.
18.	59.81	26.5	32.1	21.8	78.5	19.9	Variable		4.8	Ci.		Cu.	E	1.8	Ω a. ∩ p.
19.	59.30	27.3	33.5	21.5	71.2	18.8	NE quad.	170.7	6.2	Ci.-S.	N	Cu.-N.	ENE		Ω a. ∩ p.
20.	59.58	26.9	32.3	21.5	75.3	19.4	NE	153.6	4.7	A.-Cu.	ESE	Cu., Cu.-N.	E		Ω a. ∩ p.
21.	59.67	26.4	31	22.8	77.8	19.6	SE quad.	204	6.7	A.-Cu.	E	Cu.-N.	E	.6	Ω a. p ∩ p.
22.	59.40	26.8	34.1	21.1	74	18.8	NE	174.3	4.5	Ci.-S.		Cu.-N.	E		Ω a.
23.	58.33	27.1	30.9	23	74.7	19.8	NE quad.	159.6	5.8	A.-Cu.	E	Cu.-N.	E		p a. ∩ p.
24.	57.50	27.6	32.1	22.6	69.5	18.9	NE quad.	185	5.7	A.-Cu.	NE	Cu.-N.	E		∩ a. ∩ p.
25.	57.74	27.8	32.9	23.3	70.8	19.5	E quad.	220.5	6	Ci.		Cu.-N.	E		∩ p.
26.	57.96	28	33.8	23.1	66.8	18.5	NE	171.5	6.5	Ci.	S	Cu.-N.	E		∩ p.
27.	57.87	26.2	31.6	24											

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Temperature.				Relative humid-ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.	
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.					mm.	
1.	760.06	27.9	33.8	24	71.3	19.5	WNW, SSE	1.2	5.7	Ci.	SW	Cu.	ENE		
2.	59.32	27.1	33.5	23	78.2	20.6	NW quad.	1	4.8	Ci.	SW	Cu.	E		Ω <sup>2</sup> a.
3.	59.24	26.9	33.2	23.2	75.8	19.7	Variable	.7	5.3	Ci.-S.	SW	Cu.	E	0.5	Ω a.
4.	59.76	26.3	30	23.4	85.5	21.5	Variable	.3	7.5	Ci.-S., A.-S.		Cu.-N.	E	2.8	● a.
5.	59.69	26	31	23	83.8	20.7	NW quad.	.8	6.7	Ci.	SW	Cu.-N., Cu.	E	.5	○ <sup>2</sup> a. p. ● ○ p.
6.	59.29	24.9	30	23	89.7	20.9	Variable	.7	7.3	Ci.		Cu., Cu.-N.	E	8.3	● a. p. d p.
7.	58.77	26.9	32	22.8	79.7	20.6	Variable	.7	5.3	Ci.	WSW	Cu.	E		
8.	59.42	26.6	32	22	79	20.2	NW, SSE	.5	4.2	Ci.	W	Cu.	E		Ω <sup>2</sup> a. p.
9.	59.64	25.2	31.6	22	87.3	20.6	NW	1	6.2	Ci., Ci.-S.		N.	E	19.1	Ω <sup>2</sup> a. ● d ○ p.
10.	59.13	25.9	29.1	23.4	83.2	20.6	Variable	.7	8.2	Ci.		Cu.-N. E, ENE	.5		○ a.
11.	58.81	24.7	30	23	92.3	21.3	N quad.	1	9.2			Cu.-N., N.	NE	72.9	● a. ● <sup>2</sup> p.
12.	58.81	26	29.2	23.5	88.5	22	W, ESE	1.3	8.5			Cu.-N.	NNE	34.6	● <sup>2</sup> a. ● <sup>2</sup> p.
13.	60	25.8	28.3	23	88.5	21.8	ESE, SE	1.7	9.2	Ci.	N	N.	ESE	11.7	● a.
14.	60.25	26.5	29.5	24	93	22.6	SE quad.	1	9.2			N., Cu.-N.	ESE	20.8	● a. p.
15.	59.16	26.5	30.5	23.9	88.3	22.6	ESE, SE	.8	8	Ci.-S.	N	Cu.-N.	ESE	4.3	● a. p.
16.	58.64	27.9	32	24.6	79.3	22.1	ESE	1.2	6.2	Ci.-S.	NW	Cu.	SE, ESE	.5	● a. p.
17.	59.55	27.2	31	23.7	80.2	21.4	SE quad.	1	7	Ci.-S.	NW	Cu.	SE	.8	● <sup>2</sup> a. ○ <sup>2</sup> a. p. ∞ <sup>2</sup> ζ
18.	60.06	27.3	31.5	24.3	82.8	22.2	SSE	.8	6.7	Ci.-S.	NW	Cu.	SE	.5	○ <sup>2</sup> a. ● <sup>2</sup> a. p. Γ <sup>2</sup> p.
19.	59.66	26.9	31.5	24.3	81	21.1	SE quad.	.7	5.2	Ci.-S.	NW	Cu.	SE		
20.	59.98	26.2	30.7	23.3	86.3	21.7	SE	.5	6.5	Ci.		Cu.-N.	ESE	8.6	∞ <sup>2</sup> a. ● a. p. T ζ p.
21.	59.98	27	31	24.2	81.5	21.5	SE	.7	6.7	Ci.-S., Ci.		Variable	E	1.8	ζ ○ a. ● a. p.
22.	59.76	27.4	32	23.5	78.2	20.9	Variable	.8	3.7	Ci.	W	Cu.	E		Ω a.
23.	58.61	27.1	31.5	24.3	78	20.6	E quad.	1.2	6.2	Ci.-S.	W	Cu.	E	2.1	● a.
24.	57.83	27.6	31.3	24	75.8	20.6	Variable	.7	5.5			Cu.	E	2.3	● a. p.
25.	57.92	27.4	31.6	24.2	78	21	E	.8	6.3	Ci.-S.	W	Cu.	ESE	1.3	d ○ a. ● a. p.
26.	58.29	27.2	31.2	23.9	80.3	21.3	E	.5	5.7	Ci.-S.	SW	Cu.	ENE	1.3	Ω <sup>2</sup> a. ● <sup>2</sup> p.
27.	58.09	26.8	31.3	24	82.3	21.4	Variable	.8	7	Ci.	SW	Cu., Cu.-N.	E	10.1	Ω <sup>2</sup> a. ● <sup>2</sup> p.
28.	57.69	26.8	32.4	24	86.5	22.5	Variable	.3	6			Cu.	E	5.1	● a. p.
29.	57.86	27.4	31.5	24.6	79	21.4	ENE	1.3	6.7	Ci.	SW	Cu.-N.	E	.5	● <sup>2</sup> a.
30.	57.39	27.2	30.8	24.4	79.8	21.3	SE	.8	6	Ci.	SW	Cu.	NE	1.3	∞ <sup>2</sup> ζ a. ○ <sup>2</sup> a. p. ● p
Mean	759.09	26.7	31.2	23.6	82.4	21.2		.8	6.6						
Total														211.2	

## Meteorological data for first and second class stations—Continued.

## CAPIZ.

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied,  $-1.81$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	759.85	26.7	32.4	23.3	79.5	20.4	NE, ENE	212.1	4.7	Ci.	Fr.-N., Cu. NE, ENE		
2.	59.21	26.7	32.5	22.5	79	20.3	NE, ENE	203.8	2.8	Ci.	Fr.-Cu. ENE		
3.	59.11	26.3	31.8	23	78.5	19.8	NE	195.3	3.5	Variable	Cu. NE		
4.	59.58	26.7	32.5	22.8	77	19.6	NE	181.1	4.5	Ci.-S.	Fr.-N. NE		d° a.
5.	59.81	25.8	31.4	23	78	19	NE	146.1	5.5	Ci.-S.	N.-cf., Fr.-Cu. E, NE	1	d p.
6.	58.96	25.9	31.3	23	82.2	20.2	NE	156.2	6.7	Ci., Ci.-S.	N. E, NE	9.4	● a. < p.
7.	58.71	26.3	32.4	22.9	83.5	21	NE	152.7	3.5	Ci.	Cu. E	1.8	● a.
8.	59.11	26.4	32.3	22.8	80	20.1	NE, ENE	141.2	4	Ci.	Fr.-N., Fr.-Cu. E		● a.
9.	59.44	25.9	32.5	22	78	19	NE	126.7	3	Ci.	Cu. NE	.3	
10.	59.06	26.8	32.7	24.3	79	20.5	NE, ESE	178	6	Ci., Ci.-S.	N. NE		d a.
11.	58.95	26.8	32.8	23	81.8	21.1	NE	131.3	6	Variable	N. NE	1	< p.
12.	58.94	26.9	32.3	24.1	86.8	22.6	NNE	111.5	6.8	Ci., Ci.-S.	Fr.-N. NE	1	d° a. < p.
13.	59.21	25.8	31.2	23.8	87.7	21.5	ESE, SE	85.3	7.7	Ci.-S.	N. NE		d° a. < p.
14.	59.69	25.9	32.8	23.1	85.8	21.1	E, SSE	94.6	8.7	Ci.-S.	N. E, SE	.5	d° a. < p.
15.	58.95	25.4	32.9	22.8	89.7	21.4	Variable		7.7	Ci.	Fr.-N., Cu. SE, E	13.8	d° a. < p.
16.	58.55	26.2	32.1	22	89.2	22.6	E	74.6	8	Ci.-S.	N. E	9.9	● a. < p.
17.	58.93	26.5	32.6	23	86	21.9	NE	127.6	8.8	Ci.-S.	N. NE		● a. < p.
18.	59.51	26.7	32.3	23.6	85.3	22	NE	95.8	7.7	Ci.-S.	Cu. NE		● a. < p.
19.	59.23	27.1	32.7	23.8	81.5	21.6	ENE	152.6	6.2	Ci.	Cu. ENE		● a. < p.
20.	59.54	27.9	32.8	24.9	77.2	21.2	NE	209.2	4.5	Ci.	Cu.-N. NE	1.3	d° a. < p.
21.	59.58	27.7	32.8	25.6	81.2	22.2	ENE, E	221.3	4.3	Ci.	Cu. E		< p.
22.	59.34	27.4	32.8	24.4	78.8	21.2	E quad.	184.9	3.7	A.-Cu. ESE	Cu. E		
23.	58.38	27.6	32.8	25.5	79.3	21.7	ENE	275.6	3		Cu. ENE		
24.	57.81	27.8	32.8	24.9	77.3	21.3	ENE	249.6	2		Cu. E		
25.	57.74	27.8	32.8	25.4	78.2	21.6	ENE	259.1	4.8	Ci.-S.	N. ENE		< p.
26.	58.23	27.4	32.8	24.6	79.8	21.5	ENE	233.8	6	Ci., Ci.-S.	Cu. ENE		
27.	58.19	28	32.8	25.8	75.7	21.1	ENE	294.5	3.7	Ci.	Cu. E		
28.	57.83	28	32.8	25.4	80.8	22.7	ENE	272.4	6.3	Ci.	N. ENE		
29.	57.90	27.7	32.9	25.7	78.7	21.5	E	281.4	7.7	Ci.-S.	N. NE, E		
30.	57.58	27.7	33.3	24.8	79.2	21.6	ENE	179.7	4	Ci.-S.	Fr.-Cu. ENE, E		
Mean	758.90	26.9	32.5	23.9	81.2	21.1		180.3	5.4				
Total												40	

## CALBAYOG.

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.80$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	759.84	25.7	33.7	21.3	82.7	20	N	162.9	3.8	Ci., Ci.-S.	S.-Cu.	E		
2.	59.22	25.2	30.5	20.3	84	19.9	N	162.5	4.7	Ci.-S.	S.-Cu.	ENE		d° p.
3.	59.01	25.2	33.1	20.3	78.7	18.5	Variable	156.3	3.8	Ci.-S.	S.-Cu.	NE		
4.	59.50	26.8	32.7	22.1	79.7	20.6	S quad.	145.9	6.7	Ci.-S.	S.-Cu.	NE		
5.	59.72	24.3	32.2	20.1	86.8	19.4	Variable	142.3	7.8	Ci.-S.	N.	ENE	6.8	d° ● p.
6.	59.13	24.7	31.8	21.2	88.5	20.3	Variable	131.3	7.7	Ci.-S.	S.-Cu.	ENE	11.4	● d p.
7.	58.72	25.8	30.3	21.5	84.7	20.6	SE, SW	140.4	4.8	Ci.-S.	S.-Cu.	ENE		
8.	59.22	25.4	32.6	20.3	81.2	19.3	N	165.3	1.7	Ci.	S.-Cu.	ENE		
9.	59.37	25.1	31.6	20	84	19.7	Variable	145.7	4.5	Ci.	S.-Cu.	ENE	1.8	d p.
10.	59.03	26.8	34.3	21.3	77.2	19.6	NE quad.	156.1	5.3	Ci., Ci.-S.	Cu.	NE, NNE		
11.	58.82	25.5	33.7	23.6	90.7	21.9	NE	131.9	8.3	Ci.-S.	S.-Cu.	ENE	44.7	● 2 T° p.
12.	58.78	25.7	29.3	23.5	90.2	22	SE	117	8.8	Ci.-S.	S.-Cu.	ESE	1	d° a. < p.
13.	59.74	26.6	30.8	24.5	86.2	22.2	SE quad.	169.1	7.7	A.-Cu., Ci.-S.	S.-Cu.	SE	1.3	d p.
14.	59.93	25.3	30.2	23.2	92.2	22	N	116.9	7.2	A.-Cu.	SE	ESE	3.8	● < p.
15.	59.22	25.5	30	22.6	90.5	21.8	SSE, N	123.4	7.3	Ci.-S.	SE	S	5.1	● < p.
16.	58.62	26.5	31.2	22.5	85.2	21.7	S quad.	116.5	6	Ci.		E		● < p.
17.	59.14	26.8	31.2	23.4	84.2	21.8	Variable	149.7	5.8	Ci.	SE			● < p.
18.	59.82	26.1	32.4	22.6	86.2	21.4	NE, S	126.9	5.7	Ci.-S.				↓ d° p.
19.	59.62	25.2	30.5	21.7	89.2	21.2	Variable	133.8	4.7	Ci.	S.-Cu.	E	6.1	● p.
20.	59.78	26.5	33.5	21.8	82.8	21	SE	133.3	4.5	Ci.	S.-Cu.	E	4.1	● p.
21.	59.72	27	34	22.6	80.3	20.9	SE	146.2	3			E		
22.	59.56	26.5	33.4	22	84	21.4	Variable	149.2	1.2			E		
23.	58.52	27.5	34.6	23.1	81.8	21.8	E	167	1.7			E		
24.	57.79	25.5	30.6	21.6	87.7	21.2	S, W	124	3.5	Ci.-S.	S.-Cu.	NE, ENE	6.6	● d° p.
25.	58.03	25.8	32.1	22.3	87.8	21.5	SE	112.7	5.2	Ci.-S.	N., S.-cf.	E	10.4	● d° p.
26.	58.26	26.9	33.6	22.4	83.5	21.7	E	144.2	4.5	Ci.-S.	Cu.	E	.5	d° p.
27.	58.05	27.4	34.2	22.5	81	21.4	E	193.1	3.7	Ci.	Cu.	E		
28.	57.77	26.5	31.1	23.8	89.8	22.9	W, ESE	139.1	4.7	Ci.-S.	S.-Cu.	ENE	11	● < p.
29.	57.86	26.4	31.1	22.8	87.5	22.3	ENE	147.6	6	Ci.-S.	S.-Cu.	ENE	2.5	● p.
30.	57.38	27	34.5	22.6	82.8	21.6	NE	143.2	4.5	Ci.-S.	Cu.	ENE		d° p.
Mean	758.97	26	32.2	22.1	85	21.1		143.1	5.2					
Total								4,293.1					117.1	

**LEGASPI.**

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.	
1.	760.50	27.7	32.1	23.4	76.7	21.1	NE	270.2	2.5	Ci.	W	Cu.	ESE	0.3	●° p.
2.	59.64	26.7	32	21.5	75.7	19.4	NE	218.1	4.8	Variable		Cu.	E		
3.	59.34	27.6	32.7	22.7	73.3	19.3	NE	254.7	4.2	Ci., Ci.-S.		Cu.	ENE	18	●° p.
4.	60.02	26.7	31.9	21.9	80.6	20.6	NE	232.5	5.5	Ci.-S.	SW	Cu.	ENE	.5	●° a.
5.	59.90	27.1	32	22.2	76.7	20.4	NE	237.9	4.3	Ci.-S.		Cu.	ENE	.5	
6.	59.13	27.1	31.8	21.6	76	20	NEquad.	218.3	5	Ci.-S.		Cu.	ENE		●° a.
7.	59.09	27.9	32.4	23.1	75.8	20.9	NE, ENE	268.6	4.2	Ci.		Cu.	ENE		
8.	59.54	27.2	32.4	22.6	76.5	20.3	NE, ENE	196.3	2	Ci.	ESE	Cu.	E		
9.	59.76	27.9	32.7	23.1	78.7	21.9	NE	252.8	2.2	Ci.		Cu.	ENE	.5	●° p.
10.	59.29	28.1	32.5	23.7	76.8	21.6	ENE	274.9	3	Ci., Ci.-S.		Cu.	ENE		
11.	58.98	28.7	33.7	23.5	79.8	21.1	NNE	264.1	6.2	A.-Cu.	ENE	Cu.	ENE	5.5	d° a. ●° p.
12.	59.28	26.1	29	22.3	86.5	21.7	NE	281.9	9.2	Ci.-S.		N.	ENE	31.5	● a. p.
13.	59.73	26.2	30.1	23.2	87.2	22	E	221.4	10	Ci.-S.		N.	ESE	12.5	● a. p.
14.	60.04	26.2	30.4	22.8	87.8	22	E	137	9.5	Ci.-S.		Cu.-N.	ENE	22.1	●° p.
15.	59.10	25.4	31.5	21.9	91	21.8	SE, E	76.1	8.3	Ci.-S.		Cu.	ENE, SSE	25.2	d° a. ●° p.
16.	58.80	26	31.9	21.5	88.8	22.2	ESE, NE	105.6	7.8	Ci.-S.		Cu.	SSW	.8	●° p.
17.	59.17	28	33	22.8	84	23.5	Variable	137.5	6	Ci.-S.		Cu.	ESE, E		●° p.
18.	59.99	27.3	32.2	22.5	87.7	23.6	E, NE	172.6	5.8	Ci.		Cu.	E, SSE	7.9	●° p.
19.	59.83	27.1	32.4	22.1	83.2	22.1	NE		5	Ci.	ENE	Cu.	ESE	3.8	●° a. d° p.
20.	60.12	28	32.2	23	81.7	23	NE	238.1	3.5	Ci.		Cu.	ENE		●° a.
21.	60.02	28.4	32.1	24.5	79.5	22.7	NEquad.	301.9	2.8	Ci.		Cu.	ENE	1.8	d° a.
22.	60	28.2	32.5	22.8	78.7	22.1	NE	268.1	3			Cu.-N.	ESE	3.3	●° a.
23.	58.98	27.6	32	22.7	78	21.3	NE	313	3.5	Ci.-S.		Cu.-N.	E	16.8	●° a. ●° p.
24.	58.26	28.4	32.5	24	77.5	22	NE	311.3	2.5	Ci.		Cu.-N.	E	.5	●° p.
25.	58.34	28	32.1	23.9	77.7	21.8	NE	322.4	2.8	Ci.		Cu.	ESE	5.1	● a.
26.	58.83	28.2	33.1	24.3	78.7	22.2	NE	333.9	3.5	Ci.	SW	Cu.	E	4	●° p.
27.	58.69	28.1	32.2	23.5	79.7	22.5	NE	320.4	4.3	Ci.		Cu.	ENE	3	●° a.
28.	58.26	27.1	30.2	23.8	86	22.9	NNE	348	6.5	Ci.-S.		Cu.-N.	ENE	18.4	● a. p.
29.	58.34	27.9	32	23.4	81.8	22.7	NE	304.3	5	Ci.		Cu.-N.	ENE	.3	● d a.
30.	57.68	28.3	33	24.4	76.8	21.8	NE	250.5	3.2	Ci.		Cu.-N.	ENE		
Mean	759.29	27.4	32	22.9	80.6	21.7		245.9	4.9						
Total														182.3	

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	760.38	26.7	30.4	21.2	78.7	20.3	NE	283.7	2.5	Ci.		Cu.	NE	≡ 0.2 a.	
2.	59.49	27	30.8	23	76.8	20.2	NE	297.8	3.7	Ci.	S	Cu.	NE, SE	○ 0 a.	
3.	59.23	26.6	31.4	21.1	80.8	20.8	N quad.	332.1	4.3	Ci.		Cu.	NE, E		
4.	59.93	26.5	31.4	20.5	75.8	19.4	NE	338	4.2	Ci.	SE	Cu.	NE, ENE		
5.	59.80	25.2	30.7	20.2	77.5	18.2	NE, SW		6	Ci.		Cu.	NE		
6.	59.11	24.9	29.4	19.6	78.7	18.2	SW, NW		5.8	Ci.-S.	E	Cu.	E	0.2 ○ 0 a.	
7.	58.78	26.4	30.9	21.2	81.8	20.9	NE		4	Ci.	S	Cu.	E quad.		
8.	59.14	26.8	30.1	23	80.7	21	NE, N	276.9	3.8	Ci.		Cu., S.-Cu.	E		
9.	59.60	26.2	32.2	20.6	80.5	20.2	N		3	Ci.	S	Cu.	NE		
10.	59.22	27.9	32	25.6	73.7	20.6	NE	341.2	3.5	Ci.	S	Cu.	NE, E		
11.	59.13	27.3	32.2	21.6	76.3	20.2	NE quad.		2.3	A.-Cu.	NE	Cu.	NE		
12.	59.30	27.3	31	25.8	81.7	22	NE	456	7.2	Ci.		S.-Cu.	NE	d 0 a. p.	
13.	59.40	26.3	32.2	24	87.2	22.1	NE	149.9	8.2	A.-Cu.	E	S.-Cu.	SE	d 0 a. p. 3.3	
14.	58.68	26.6	32.3	23.4	86.5	22.2	SW	160.5	9.7	Ci.-S.	SW, W	S.-Cu.	SE quad.	3.8	
15.	58.74	26.1	30.4	23.3	88.7	22.2	SW	150.6	9.2	Ci.	NW	S.-Cu.	S	10.5	
16.	58.26	26.8	30.7	23.8	86.8	22.6	E, SW	156.3	9.8	Ci.-S.		S.-Cu.	S quad.	3.3	
17.	58.87	25.8	30.4	23.5	89.7	22	SW	157.6	8	Ci.	W	S.-Cu.	NW, SE	d 0 a. p. 21.9	
18.	59.71	25.7	29.9	23.6	89.2	21.8	W quad.	193.6	9	A.-Cu.	NW	S.-Cu.	NE	37.9	
19.	59.64	26.3	30.2	22.8	84.8	21.4	N	325.5	8.7	Ci.	W	S.-Cu.	NE, E	d 0 a. p. 4.1	
20.	59.88	27.4	31	23.8	81.8	21.9	N quad.	292.9	6.8	A.-Cu.	E, W	S.-Cu.	NE, E	3.3	
21.	59.82	28.1	31.4	24.3	78.8	22.1	E	258.4	5	Ci.	E	Cu.	NE quad.	d 0 a. p. 4.1	
22.	59.78	27.6	31	23.5	80.3	21.7	NE		4.7	Ci.	E, NW	Cu.	NE	d 0 p.	
23.	58.92	27.7	32.3	23.5	78.2	21.5	NE, E	279	5.2	A.-Cu.	E	Cu.	NE	1 p.	
24.	58.28	28.3	32.4	23.9	75.8	21.6	NE	357.8	3.7	A.-Cu.		Cu.	E		
25.	58.23	28.3	31.2	25	78.8	22.5	NE		4.7	A.-Cu.	E	Cu.	ENE	14.8	
26.	58.78	28.5	31.8	26.4	76.7	22	NE	468.2	4.5	Ci.	S	Cu.	E	3.3	
27.	58.83	27.9	31.2	26.2	78.5	21.8	NE	456.6	5.3	A.-Cu.	E	Cu.	ENE	8	
28.	58.52	27.8	30.8	26.3	79.7	22.1	NE	547	4.7	Ci.	SW	Cu.	NE, ENE	3.3	
29.	58.34	28.1	31.4	24.6	78.8	22.2	NE	456.2	3.5	Ci.	W	Cu.	NE, E	d 0 a. p.	
30.	57.78	27.2	30.6	22.9	80.3	21.3	NE	301.8	3.5	Ci.	WSW, W	Cu.	NE	0 a. p.	
Mean	759.15	27	31.1	23.3	80.8	21.2		306	5.5						
Total														100.4	

## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5<sup>a</sup> meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
							Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.	Upper.	Lower.	
1.	759.80	27.4	34	21.4	63.8	17	E	2	5	Ci.-S.	Cu.	E
2.	58.96	26.9	34	20	66.3	17	E	1.7	6	Ci.-S.	Cu.	ESE
3.	58.66	26.7	34.6	19.2	67.2	16.8	NE	1.7	4.3	Ci.-S.	Cu.	E
4.	59.50	26.8	33.4	21.4	65.5	16.6	NE	1.5	4.8	Ci.-S.	Cu.	ESE
5.	59.33	25.6	34.2	20.1	68.7	16.1	Variable	1.3	6	Ci.-S.	S.-Cu.	E
6.	58.57	26.1	34.4	18.7	66	16.1	E	1	5.3	Ci.-S.	S.-Cu.	E
7.	58.16	27.2	33.5	22	68.5	17.9	ENE	1.2	5.8	Ci.-S.	Cu.	E
8.	58.58	27.3	35.5	21	68.8	17.7	E	1.3	5.2	Ci.-S.	Cu.	E
9.	59.08	26.5	34.4	20.1	69.7	17.5	ENE	2	4.8	Ci.-S.	Cu.	E
10.	58.71	27	34.7	21.1	69.8	18	NE quad.	1.2	5.3	Ci.-S., Ci.	S.-Cu.	E, SE
11.	58.52	28.3	34.8	22	66.3	18.5	NE, ENE	1.3	4.2	Ci.-S.	Cu.	E
12.	58.84	28.4	35.1	23	69.7	19.7	NE quad.	2.3	5.5	Ci.-S.	Cu.	E
13.	58.88	27.2	34.9	24.2	79.8	21.2	NE quad.	1.2	7.2	Ci.-S.	S.-Cu.	ENE
14.	59.26	26.8	32	23.7	83.5	21.7	W	1.2	8.5	Ci.-S.	S.-Cu. SE quad.	5.7
15.	58.53	26.4	31.5	23.5	85.2	21.6	E, SSW	1	8.7	Ci.-S.	S.-Cu.	SE
16.	58.24	27.2	32.1	23.5	81.7	21.7	Variable	1.2	9.2	Ci.-S.	N.	S quad.
17.	58.55	26.6	34	23.9	84.2	21.8	N, NE	1.2	8.7	Ci.-S.	N.	SW
18.	59.39	25.7	31.5	23	88.8	21.6	NE	1	8.5	Ci.-S.	N.	S, SSE
19.	59.35	26	33	22.9	85.2	21.2	NE quad.	1.3	8.3	Ci.-S.	N.	E
20.	59.40	28	33.4	23.6	73.8	20.4	NE	1.7	6.8	Ci.-S.	Variable	E
21.	59.29	28.4	33.4	23.5	70.8	20	NE	1.5	6.3	Ci.-S.	Cu. SE, ESE	d a.
22.	59.09	28.3	34.4	23	66.7	18.7	NE	1.5	5.7	Ci.-S.	Cu.	E
23.	58.09	28.1	32.6	24	68.8	19.2	NE	1.8	6.5	Ci.-S.	S.-Cu.	E
24.	57.54	27.8	33.7	22.5	68.8	18.8	NE	2.2	5	Ci.	Cu.	E
25.	57.57	28.3	32.6	24.8	70.5	19.9	NE	2.3	6.3	Ci.-S.	Cu.	E
26.	58.08	29.1	34.5	25.1	63.8	18.9	NE	2.8	5.7	Ci.-S.	Cu.	ENE
27.	58.28	27.9	33.4	24.6	69.8	19.2	NE	2.5	5.5	Ci., Ci.-S.	Cu.	E, SE
28.	57.91	28.8	34	24.4	68	19.5	NE, E	2.7	6.8	Ci.-S.	Cu.	ENE
29.	57.64	28.8	34.1	25.5	65.8	19.1	NE	3	4	Ci.	Cu.	ENE
30.	56.99	28.8	34.5	24.9	65.5	18.9	NE	1.7	6	Ci.-S.	Variable	E
Mean	758.63	27.4	33.7	22.7	71.7	19.1		1.7	6.2			
Total												74.1

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
							Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	760.84	25.6	31	21	79.3	19	E quad.	172.8	2.8	Ci.	Cu.	E
2.	59.99	26.1	30.6	22.1	78.2	19.3	NE	164.7	2.7	Ci.	Cu.	E
3.	59.71	25.3	31.8	21.2	82.7	19.6	E	156.1	3.3	Ci.	Cu.	E
4.	60.48	25.4	31.3	20.8	79	18.7	E	167.5	5	Ci.-S.	Cu.	E
5.	60.30	24.5	30.1	20.2	82.3	18.4	E, ENE	103.5	4.5	Ci., Ci.-S.	Cu.	E
6.	59.46	25.2	30.8	20.1	84	19.8	E	146.3	7.5	Ci.-S.	Cu.	E
7.	59.10	26.4	31.8	22	83.2	21.1	NE	184.8	3	Ci.	Cu.	E
8.	59.62	26	31	21.4	84.2	20.8	NE	148.4	2.3	Ci.	Cu.	E
9.	59.68	26.2	31.8	21.7	82.5	20.5	ENE	186.9	1.7	Ci.	Cu.	E
10.	59.68	26.1	31.3	21.7	81.2	20.4	E	166.2	3.7	Ci.	Cu.	E
11.	59.57	26.4	31.8	21	81.2	20.4	ENE	173.2	4.8	Ci.	Cu.	E
12.	59.74	26.6	29.8	24	87.5	22.6	ENE	188.9	8.2	Ci.-S.	Cu.	E
13.	59.82	26.2	30	23.8	87.7	22	ENE	115.2	8.5	Ci.-S.	Cu.	E
14.	60	26.1	30.2	24	89.7	22.4	E	151.5	10	Ci.-S.	Cu.	E
15.	59.30	26	31.8	23.1	90.2	22.9	ENE, S	105.6	7.7	Ci.-S., Ci.	Cu.	E
16.	58.50	26.4	32.1	23.2	89.8	22.9	NE	84.3	8.8	Ci.-S.	Cu.	E
17.	59.16	26.5	32.4	23.8	88.8	22.8	Calm	85.8	9.7	Ci.-S.	Cu.	E
18.	60.08	26.3	32	23.4	89.8	22.8	Calm	63.3	8.2	Ci.-S.	Cu.	E
19.	59.94	27.2	31.8	23.7	83.5	22.6	E	185.5	8.8	Ci.-S.	Cu.	E
20.	60.24	27.6	32	23.9	82.8	22.7	E	203.5	5.5	Ci.	Cu.	E
21.	60.16	27.6	32	24.5	83.3	22.7	E	228.9	3.8	Ci.	Cu.	E
22.	60.24	27.3	31.3	23.1	80	21.3	E	260.7	6.5	Ci.	Cu.	E
23.	59.31	27.1	30.8	24.5	82.2	22.5	E, NE	264.4	5.7	Ci.	Cu.	E
24.	58.82	27.4	31.2	24.1	83.2	22.8	NE	335.3	4.5	Ci.	Cu.	E
25.	58.75	28.2	31.3	25.1	79.8	22.7	ENE	337	5.2	Ci.	Cu.	E
26.	59.23	28	32.3	25.9	78.2	22	NE	311.6	5.5	Ci.	Cu.	E
27.	59.25	27.8	32.1	25.5	82.3	21.9	ENE	373.8	6.7	Ci.	Cu.	E
28.	58.91	27.2	31	25.5	80.2	22.4	ENE	282.6	4.8	Ci.	Cu.	E
29.	58.81	28	32.3	24.7	80.2	21.8	NE	192.8	2.8	Ci.	Cu.	E
30.	58.07	27.4	31.8	24	81	21.8						
Mean	759.57	26.6	31.4	23	83.2	21.4		192	5.6			
Total								5,760.6				128.5

<sup>a</sup> This is an approximate height of the barometer above sea level.

## Meteorological data for first and second class stations—Continued.

## SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied, -1.69 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.					mm.	
1.	760.39	27.4	35.2	21	67.2	17.3	E	2.7	3.3	Ci.		Cu.	E	—	☉ a.
2.	59.56	26.5	35.6	17.5	61	14.5	NW	1.5	2.8	Ci.		Cu.	E	—	☉ a.
3.	59.16	27.6	36.4	19.3	59.7	15.2	NE	2.3	3.5	Ci.	SE	Cu.	E	—	☉ a.
4.	59.87	26.9	36	20	63.3	15.7	NE	2	4.3	Ci.	SW	Cu.	E	—	☉ a.
5.	59.74	27.2	35.4	20.2	60.2	15.3	NE	1.5	4.7	Ci.	SW	Cu.	E	—	☉ a.
6.	59.08	27.1	36.1	19.2	59.3	14.9	NE	2	4.7	Ci.	SW	Cu.	E	—	☉ a.
7.	58.62	28.2	36.4	19.6	64.7	17.6	E	2.2	3.8	Ci.		Cu.	ESE	—	☉ a.
8.	59.06	28.6	37.1	22.3	63.2	17.6	NE	2	5.2	Ci.		Fr.-Cu.	E	—	☉ a.
9.	59.58	28.3	36.1	21.8	63.3	17.2	N, E	2.7	3.5	Ci.		Cu.	NE	—	☉ a.
10.	59.22	28.3	36.9	19.8	65.2	17.3	NE	1.8	2.5	A.-Cu.		Cu.	SE, ESE	—	☉ a.
11.	59.05	29.2	36.6	22	62.3	17.9	N	1.8	3.8	A.-Cu.		Cu.	E quad.	—	☉ a.
12.	59.48	28.2	36.5	21.6	68.8	19	E	2.8	4.3	Ci.		Cu.	E	—	☉ a.
13.	59.43	29	35.8	24	69.5	20.3	E	2.2	6.2	Ci.		Cu.-N.	ENE	—	☉ a.
14.	59.50	28.2	37	23.4	78.2	21.4	N, E	1.8	6.5	Ci.	SW	Cu.-N.	ESE	39.9	☉ a.
15.	58.85	27	34.8	23.7	86.5	22.4	N	1.7	7.5	Ci.-S.		Cu.-N.	S	17.3	☉ a.
16.	58.59	26.9	34.5	23.4	85	21.9	N	1.8	6.7	Ci.		Cu.-N.	SE, ENE	—	☉ a.
17.	59.04	27.6	34	22.8	81.5	22	N, ESE	2.3	7.2	Ci., Ci.-S.		Cu.-N.	E, SSE	8	☉ a.
18.	60.06	26.3	32.7	22.8	87.8	22	N	1.5	7.8	Ci.-S.		Cu.-N.	ESE	3.3	☉ a.
19.	59.89	25.7	33.4	22.1	88	21.3	NE, N	2	7.2	Ci.	SW	Cu.-N.	SE, W	11.7	☉ a.
20.	60.07	27.6	33.7	22.4	79	21.1	NE	2.2	5.3	Ci.		Cu.	E	—	☉ a.
21.	59.98	27.7	33.2	22.5	76.3	20.6	SE, N	2.7	4.5	A.-Cu.	ESE	Cu.	E	—	☉ a.
22.	59.74	28	34.1	22.2	72	19.8	NE, ESE	2.2	3.8	Ci.	SSE	Cu.	SE, E	—	☉ a.
23.	59.02	27.3	33.1	22	70.3	18.4	NE quad.	3	3.2	A.-Cu.	E	Cu.	ESE	—	☉ a.
24.	58.44	27.6	33.8	22.1	71.2	19	E, N	3	4.2	A.-Cu.	SE	Cu.	E	—	☉ a.
25.	58.66	27.2	34.9	21.6	75	19.7	E	2.7	4	Ci.		Cu.-N.	E	—	☉ a.
26.	59.02	27.4	33.5	21.6	71.3	18.7	ESE	2.7	2.2	Ci.		Cu.	ESE	—	☉ a.
27.	59	27.6	34.6	22.3	71	19	E	2.2	3.8	Ci.-S.	SE	Cu.	E	—	☉ a.
28.	58.84	27.7	34.4	22.3	70	18.6	SE	2.7	4.5	Ci.		Cu.	ESE	—	☉ a.
29.	58.42	27.8	34.4	21.4	70.7	19	NE	2.8	2.8	Ci.		Cu.	ESE	—	☉ a.
30.	57.68	29.1	35.5	23.4	65.5	19.1	NE	2.3	4.7	Ci.		Cu.	E	—	☉ a.
Mean	759.23	27.6	35.1	21.7	70.9	18.8	—	2.2	4.6	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	73	—

## DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied, -1.67 mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	759.47	28.3	35.9	23.6	72.7	20.5	NW, SE	235.1	3.8	A.-Cu.	E	S.-Cu.		∞ a.	
2.	58.88	26.9	34.2	20.5	72.3	18.8	NW	272.5	2.2	Ci.		Cu.			
3.	58.56	27.3	34.5	22.6	73.7	19.7	NW quad.	272.5	3.7	Ci.-S.		S.-Cu.	SE		
4.	59.14	28.2	36.3	22	70.8	19.8	SE, NW	236.2	2.7	Ci.		Cu.			
5.	58.99	28.1	34.7	22.5	66.8	18.5	NW	230.9	5	Ci.		S.-Cu., Cu.		∞ a.	
6.	58.32	28	35.5	22.5	69.7	19.1	SE	225	6.8	Ci., Ci.-S.		Cu.		∞ p.	
7.	58.07	27.6	34.3	21.6	74	20	NW quad.	237.3	3	Ci.		Cu.			
8.	58.40	28.4	33.5	23.5	71.3	20.1	NW	216.5	2.8	Ci.		S.-Cu., Cu.		∞ a.	
9.	58.67	28.3	36.3	22.6	74.8	20.9	NW	217.9	1.5	Ci.		Cu.	SE	∞ a.	
10.	58.57	28.3	35.9	23	66.2	18.6	NW	260.2	1.2	Ci.		Cu.		∞ a.	
11.	58.41	28.6	34.8	23.5	72.3	20.6	NW	284.9	3.7	A.-Cu.		Cu.		∞ a. ↙ p.	
12.	58.71	28.9	35.8	24	73.8	21.4	SE, NW	282	3.5	Ci.		Cu.	SSE	∞ a.	
13.	58.66	28.7	36.4	24.3	73.8	21.2	Variable	246.2	3.7	A.-Cu.		Cu.		∞ a. ↗ p.	
14.	58.63	29	37.8	23.5	74	21.3	SE	269.2	4.7	Ci.		S.-cf.	SE	20.6 ● ↗ p.	
15.	58.31	27.6	32.5	24	81.2	22	SE, NW	211.7	6.3	A.-Cu.		S.-Cu.			
16.	58	27.3	32.4	23	79.3	21.2	E	218.7	3.5	Ci., A.-Cu.		S.-Cu.	ENE	∞ p.	
17.	58.24	28.4	37.8	22.2	75.7	20.9	E quad.	225.7	5.8	A.-Cu.	E	Variable		∞ a. ↗ ●² p.	
18.	59.38	26	34.3	23	86.5	21.5	SE quad.	173.7	9.2	A.-Cu.		S.-cf.	SE	∞ a. p. ↗ ●² p.	
19.	59.06	26.2	31.1	23.5	84.5	21.2	SE	233	7.3	A.-S.		Fr.-N.		∞² a. d° p.	
20.	59.23	27.3	36.2	22.5	75	19.6	SE	204.7	2.5	Ci.		Cu.		∞ a. ↗° p.	
21.	58.95	28.6	36.8	22.6	73.3	20.7	S quad.	219.6	2.8	Ci.		Cu.			
22.	58.82	29.1	37.2	23.5	70.8	20.6	SE	247.8	2.2	Ci.		Cu.			
23.	57.80	29.4	36.8	23.5	61.8	18.1	S quad.	283.7	2.3	Ci.		Cu.		∞ a.	
24.	57.19	29.2	37	23.6	62.7	18.4	SE quad.	292.8	1.8	A.-Cu., Ci.		Cu.		∞ a.	
25.	57.44	29.3	37.5	23.1	65.5	19.2	SE	247.1	2.7	A.-Cu.	SSE	Cu.		∞ a.	
26.	57.92	29.3	37.2	23.1	62.3	18.1	S, SE	277.8	2.7	A.-Cu.	ESE	Cu.		d° p.	
27.	58.03	28.1	33.8	22.5	69.7	19.5	N quad.	219.8	.8	Ci.		Cu.		∞.	
28.	57.64	28.7	36.3	22.9	64.5	18.6	SE, S	236.3	1.7	Ci.		Cu.		∞.	
29.	57.32	28.9	37.3	22.2	68.5	19.9	NW, SSE	242.9	3.2	Ci., A.-Cu.		Cu.		∞ a. ↗ ●² p.	
30.	56.90	28.7	35.9	23	73.2	20.7	SE, NW	237	2	Ci.		Cu.		∞ p.	
Mean	758.39	28.2	35.5	22.9	72	20		242	3.5						
Total								7,258.7					149.4		

## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Mean.	Maximum.	Minimum.	Prevailing direction.	Force (mean).			Amount (mean).	Form and its direction.				
									Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	759.78	27.8	33.5	24	74	20.3	NNE	3.5	7	Ci.-S.	S.-Cu.		● a.
2.	59.11	28.1	34	24.1	70.5	19.5	NNE	3.8	9	Ci.-S.	S.-Cu., Cu.		
3.	58.92	27.8	32.4	24.1	73.5	20.3	NNE	3.5	10	Ci.-S.	S.-Cu.		
4.	59.27	28.6	34.5	24.4	67.2	18.8	Variable	3.2	10	Ci.-S.	S.-Cu.		
5.	59.22	28.2	32.8	23.6	68.5	19.2	Variable	3	10	Ci.-S.	S.-Cu., Cu.		○° p.
6.	58.51	27.7	33.6	23.1	72.3	19.7	Variable	2.8	10	Ci.-S.	S.-Cu.		○° 2 a. p.
7.	58.31	27.6	33.1	23.1	75.2	20.3	SE quad.	2.7	6.5	Ci.-S.	S.-Cu., Cu.		
8.	58.72	28.4	34.4	22.9	72.7	20.4	N	3	3.8	Ci.-S., A.-S.	S.-Cu.		
9.	58.86	28.3	33.8	23.1	73	20.5	S, NW	2.7	6.3	Ci.-S.	S.-Cu.		
10.	58.77	28.7	33.4	23.7	71.2	20.4	Variable	3.3	4	Ci.-S.	S.-Cu.		↑ ↓ p.
11.	58.76	28.4	34.4	23.7	74.2	20.9	Variable	3	4.8	Ci.-S.	Cu. NNW, NNE		
12.	59.07	28.6	34.1	24.1	75.7	21.9	NNE, N	3.3	5	Ci.-S.	Cu. N		↑ ↓ p.
13.	58.91	29.2	34.6	24	74.8	22.2	N quad.	2.8	7.5	Ci.-S.	S.-Cu.		↑ ↓ p.
14.	58.98	29.2	34.1	25.4	73	21.8	SSE, WNW	3.2	7.3	Ci.-S.	S.-Cu.		↑ ↓ p.
15.	58.41	28.4	33.6	24.6	77.2	21.8	N quad.	3	6	Ci.-S.	Cu. N		↑ ↓ p.
16.	58.30	28	33.6	22.8	75.7	20.9	N quad.	2.8	5.3	Ci.-S.	Cu.		○° a. p. p. p.
17.	58.60	28.4	33.9	24.1	77.5	21.9	Variable	2.7	7.5	Ci.-S.	N.-cf., S.-Cu. SE, W	27.2	○° a. p. p. p.
18.	59.24	27	32.9	23.7	79.5	20.9	SSE	2.5	10	Ci.-S.	Cu.-N.		○° a. p. p. p.
19.	59.20	25.6	27.1	23.6	86.8	21.2	SSE	2.2	8.8	Ci.-S.	S.-Cu., N.	2.5	○° a. p. p. p.
20.	59.44	28	34.4	22.6	77.2	21.3	Variable	2.5	6	Ci.-S.	S.-Cu.		○° a. p. p. p.
21.	59.24	28.9	35	24.6	72.2	21	SE	3.2	6.3	Ci.-S.	Cu.		
22.	58.99	28.9	34.9	24.9	70.3	20.5	SSE, NW	3.7	6.8	Ci.-S.	S.-Cu.		
23.	57.96	29.3	36.1	24.6	64.7	18.7	SE quad.	3.2	2.3	Ci.-S.	S.-Cu., Cu.		
24.	57.40	29.2	35.6	23.9	64	18.7	SE	3.8	1.7		S.-Cu.		
25.	57.58	28.8	33.6	24.9	70.3	20.6	SE, NNE	3.8	3.5	Ci.-S.	S.-Cu.	6.9	↑ ↓ p.
26.	58.07	28.4	33.9	23.5	71	20.1	SE, SSE	3.3	2.8	Ci.-S.	S.-Cu.		↑ ↓ p.
27.	58.18	28.5	34	23.1	75	21.5	SSE	2.5	1.5	Ci.-S.	S.-Cu.		
28.	57.89	29	35.9	23.3	71	20.6	SE quad.	2.5	5	Ci.-S.	S.-Cu.		d p.
29.	57.57	29.1	35.9	22.9	69.5	20.4	SSE, NNE	2.8	2.5	Ci.-S.	S.-Cu., Cu.		↑ ↓ p.
30.	57.08	29.6	34.3	25.9	68.2	20.8	SSE	3.8	4.8	A.-Cu., Ci.-S.	S.-Cu., Cu.		↑ a. p. p.
Mean	758.61	28.4	33.9	23.9	72.9	20.6		3.1	6.1				
Total												39.4	

BAGUIO.<sup>a</sup>[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	637.61	18.6	24.3	15.1	83.3	13	E quad.	284.4	8.4	A.-Cu.	SE		d° a. ≡ p.
2.	36.85	17.8	24	14.9	87.3	13.2	W quad.	297.9	7.7	Ci.	SSW		○° a. ≡ p.
3.	36.52	17.6	23.2	14.4	85.3	12.8	SE, SW	273.1	8.4	Ci.	SW	N.-cf.	○° a. ≡ p.
4.	37.14	17.8	23.8	14.1	80	12.1	Variable	279.7	7.6	Ci.	SW		○° a. ≡ p.
5.	37.04	18	23.9	15.1	79.3	12.1	Variable	238.1	8.3	Ci.	SW		○° a. ≡ p.
6.	36.39	18.2	24.3	14.3	78	11.8	SE	281.9	8.1	Ci.-S.	WSW		○° a. ≡ p.
7.	36.30	18.3	25.4	14.6	75.7	11.8	W quad.	327.1	5.6	Ci.	WSW	Variable	○° a. ≡ p.
8.	36.78	18.8	24.7	14.6	83.7	13.4	SW	242.1	4.7	Ci.-S.			○° a. ≡ p.
9.	36.98	17.9	24.6	15.1	88.5	13.4	WSW	258.3	5.9	Ci.			○° a. ≡ p.
10.	36.74	18.1	24.4	15.3	85.8	13.2	W quad.	316.7	6.7				○° a. ≡ p.
11.	36.81	18.7	25.6	15	80.3	12.9	SE, WSW	297.1	4.7				○° a. ≡ p.
12.	37.21	19.1	25.5	16.1	81.7	13.3	Variable	312	5.9	Ci.			○° a. ≡ p.
13.	37.22	18.8	25.3	15.4	83.2	13.4	SE, WSW	308.6	6.4	Ci.			○° a. ≡ p.
14.	37.30	19.6	25.9	16.5	86.2	14.4	ENE, WSW	342	6.7	Ci.			○° a. ≡ p.
15.	36.60	18.9	25.1	15.5	84.8	13.7	SE	293.2	7.1	Ci.			○° a. ≡ p.
16.	36.33	18.3	24	15.4	90.2	14.2	WSW	318.4	8.3	Ci.			○° a. ≡ p.
17.	36.74	18.2	27	15.6	88	13.5	SE, E	365.3	7	Ci.			○° a. ≡ p.
18.	37.37	17.4	22	15.6	92	13.6	SE quad.	261.9	9.7	A.-Cu.	S		○° a. ≡ p.
19.	37.18	17.8	21.4	15.4	84.5	12.8	SE quad.	367	9.7	Ci.			○° a. ≡ p.
20.	37.56	18.1	24.1	15.2	86.8	13.4	SE, SW	277.7	5.7	Ci.			○° a. ≡ p.
21.	37.46	18.8	25.9	15.8	83.5	13.3	E quad.	398.6	5.7	Ci.			○° a. ≡ p.
22.	37.22	18.9	26	15.6	78.7	12.6	SE	488.9	4.4	Ci.			○° a. ≡ p.
23.	36.43	19.4	26.3	15.3	76.3	12.5	ESE	383.8	2.6	A.-Cu.			○° a. ≡ p.
24.	35.92	19.1	25.4	15.8	71.8	12	E quad.	605.2	3.6	Ci.			○° a. ≡ p.
25.	36.27	19.8	25.8	15.9	68.5	11.5	E, SE	478.9	3.6	Ci.			○° a. ≡ p.
26.	36.74	19.7	26.8	16.2	72	12.2	Variable	417.5	3.6	Ci.			○° a. ≡ p.
27.	36.72	19.5	25.3	15.7	74.5	12.6	SE	359.7	5.6	Ci.			○° a. ≡ p.
28.	36.40	19.6	25.3	15.2	67.5	11.4	SE, ESE	369.3	4.6	Ci.			○° a. ≡ p.
29.	36.17	19.7	26.1	15.8	72.7	12.2	E quad.	405.5	4.4				○° a. ≡ p.
30.	35.66	18.8	24	15.8	87	14	NW	272.4	8.1	Ci.-Cu.			○° a. ≡ p.
Mean	636.79	18.6	24.8	15.3	81.2	12.9		337.4	6.3				
Total								10,122.3				91	

<sup>a</sup> The barometric readings of this station are not reduced to sea level.



**VIGAN.**

Day.	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.	Total movement in 24 hours.	Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
	Pressure (mean).	Mean.	Maximum.					Minimum.	Amount (mean).	Form and its direction.				
						Prevailing direction.				Upper.			Lower.	
	mm.	°C.	°C.	°C.	P. et.	mm.	Km.	0-10.				mm.		
1.	759.88	27.3	32.2	24.2	79.2	21.3	NW quad.	162.1	4.3	A.-Cu.	ESE	Cu.-N.	NW	
2.	59.16	27.3	32.5	23.8	80	21.4	NNW	348.2	1.8	Ci.		Cu.	NW, NE	
3.	58.99	26.3	32.9	21.5	78.5	19.8	N quad.	248.2	2.3	Ci.		Fr.-Cu.		
4.	59.31	26.8	32.1	22.5	75.5	19.7	Variable	116.5	1.2	Ci.-S.		Cu.	SW	
5.	59.30	26.6	31.6	22.7	82.2	21.2	Variable	145.3	1.3	Ci.		Cu.	SW	
6.	58.68	26.8	31.8	23.5	81.5	21.2	Variable	135.3	3	Ci.		Cu.	SW	
7.	58.38	27.2	33.3	22.7	75.8	20	N quad.	176.1	.7	Ci.		Cu.		
8.	58.73	27.9	33.7	23.7	79.3	21.9	Variable	160.4	2.8			Cu.	WNW	
9.	58.75	28.5	34.3	24.3	79.3	22.8	NW quad.	126.6	3	A.-Cu.	E	Cu.		
10.	58.75	28	32.5	25.2	81.3	22.8	Variable	199.8	4	Ci.-Cu.		Cu.	NNW	
11.	58.83	28	32.9	23.8	80.7	22.6	N quad.	224.7	5.7	A.-Cu.	SSW	Cu.	WNW	
12.	59.08	28.4	34.2	24.3	81.5	22.7	N quad.	225.7	2.7	A.-Cu.		Cu.	NW	
13.	58.98	28.1	32.8	24.5	79.8	22.5	Variable	172.7	2.2	Ci.		Cu.	SW	↘ p.
14.	59.03	28.7	33.2	25.3	77.7	22.6	S quad.	165.1	2.8	Ci.-S.		Cu.	SW, SSE	↘ p.
15.	58.34	28.1	33.8	24.7	79.3	22.2	NNW	243.7	2.2	Ci.-S.		Cu.	NNE	↘ p.
16.	58.18	28	33.1	25	80	22.3	NNE, NNW	280	3.2	A.-Cu.	N	Cu.	NNE, N	
17.	58.57	28.9	33.8	24.5	74.5	21.4	Variable	186.5	3.3	Ci.-S.		Cu.		↘° a. ↘ p.
18.	59.20	27.4	33.6	25.2	78.5	21.2	SE	196.5	7	A.-Cu.	SSE	Cu.	Variable	↘ a.
19.	59.54	27	30.7	24.7	78.8	20.9	Variable	125	8.8	A.-Cu.	SSW	Cu.-N.	NNW, S	
20.	59.61	28.9	34.3	24.4	75.5	21.9	NW quad.	177	5.5	A.-Cu.	SE	Cu.		↘° a. ⊥ p.
21.	59.38	28.2	33.2	24.2	72.2	20.4	Variable	207.6	2.7	Ci.-S.		Cu.	W	↘° a. ⊥ p.
22.	59.21	28.3	34.1	24.8	70.5	20	ESE, nnw	221	2.7	Ci.		Cu.	WNW	
23.	58.01	28.7	32.7	24.7	74	21.5	SW	183.2	2.7	A.-Cu.		Cu.	SW	
24.	57.56	28.9	34.2	24.3	74.8	21.8	NW quad.	197.7	2	Ci.		Cu.	NW	↘ p.
25.	57.74	28.7	34.2	25.5	71.2	20.5	Variable	211.5	2.7	Ci.-S.		Cu.	NW	↘ p.
26.	58.10	29.4	34.8	24.9	68.8	20.6	Variable	207.6	3.3			Cu.	NW	↘ p.
27.	58.15	29.3	34.9	24.9	71.3	21.2	NNW	185.9	3.7	A.-Cu.	E	Cu.	NNW	↘ p.
28.	58.03	29.2	34.6	25.7	66.7	20	NW	149.6	3.8	A.-Cu.	S	Cu.	NW	↘ p.
29.	57.70	29.7	34.8	26.2	66.8	20.4	NW quad.	247.9	2.8			Cu.	N	↘ p.
30.	57.33	29	34	26	68.8	20.4	Variable	195.7	3.3	A.-Cu.	SW	Cu.	SSW, NW	↘ p.
Mean	758.68	28.1	33.4	24.4	76.1	21.3		194.1	3.2					
Total								5,823.1						.5

Day.	Pressure (mean).			Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	mm.	°C.	°F.	°C.	°F.	P. of.			mm.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
													Upper.	Lower.		
1.	760.55	28	37.2	22.5	68.2	18.2	SE	0-12.	1.3	6.3	Cl.-S.	Cu.-N., Cu.	S	mm.	d° a.	
2.	59.50	26.9	37	19.4	67	17.3	NW	1.3	3	3	Cl., Ci.-S.	S.-Cu.			Ω <sup>2</sup> a.	
3.	59.21	27.1	35.4	21.5	69	17.8	NW	.7	5.8	5.8	Ci.	Cu.	N, NW			
4.	59.68	27.4	37	21.6	72.3	18.3	Variable	.5	3.5	3.5	Ci.	Cu.				
5.	59.43	27.6	37.1	21.1	66.2	17.5	SE, NE	1	2	2	Ci.	Cu.			Ω a.	
6.	58.58	28	37.7	21.6	68.8	18.8	SE, NW	1.2	4.7	4.7	Cl.-S., Ci.	Cu.				
7.	58.51	27.4	34.5	21	74.3	19.5	SE	.3	4.5	4.5	Ci.	Fr.-Cu.	SW			
8.	58.88	29.1	38.4	22.8	67.8	19.7	Variable	.8	4.3	4.3	Ci.	Cu.	SW			
9.	59.24	28.3	37.8	22.3	69	19	S quad.	.8	3.8	3.8		Fr.-Cu.	SW			
10.	59.14	28.3	38.5	20.5	64.3	17.7	SE, NE	.7	1.3	1.3		S., Cu.-N.				
11.	59.16	28.4	38.4	22.1	67.7	18.6	E quad.	1	2.8	2.8	Ci.	Fr.-Cu., S.-ef.	S, N	Ω <sup>2</sup> a.		
12.	59.64	29	38.2	23.1	67.5	19.4	SE	1.3	5.5	5.5	Ci., Ci.-Cu.	Cu.-N.	SE	Ω <sup>2</sup> p.		
13.	59.60	29.3	39.3	22.6	67.8	19.6	S	1	4.7	4.7	Ci.	Cu.-N.	SE	Ω <sup>2</sup> p.		
14.	59.43	29.3	39	24	70.2	20.5	SE, SW	1.2	4.8	4.8	Ci.	Cu.-N.	SE	1.3	Ω <sup>2</sup> p.	
15.	58.59	28.7	37.4	23.5	72.7	20.6	N quad.	.8	5	5	Ci.	Cu., Cu.-N.	SW	Ω <sup>2</sup> p.		
16.	58.31	28.6	36.4	23	70.7	19.9	N quad.	.8	3.8	3.8		Cu.	SE			
17.	58.88	28.7	39.4	22.8	71.5	20.2	Variable	1.2	7.3	7.3		Cu.	N			
18.	60.40	25.6	35.1	22.4	82.2	19.8	Variable	.5	8.7	8.7	Ci.-Cu., Ci.-S.	Cu.-N.		23.9	Ω <sup>2</sup> a. ● <sup>2</sup> Ω <sup>2</sup> p.	
19.	60.29	26.4	31.8	22	81.2	20.6	W, NE	.3	9.3	9.3	Ci.-S.	Cu.-N.	S, NW			
20.	60.26	27	36.1	23.6	82.8	21.8	SE	.3	6.3	6.3	Ci., Ci.-Cu.	Cu.-N.	S		Ω <sup>2</sup> d° Ω <sup>2</sup> p.	
21.	59.90	28.8	36.6	23	72	20.5	SE	.8	6	6	Ci.	Cu.-N.	S		Ω <sup>2</sup> p.	
22.	59.76	29.9	38.1	22.4	68.3	19.4	Variable	1	3.3	3.3		Cu.-N.	SW			
23.	58.92	29.3	37.2	23	62.2	18.1	S quad.	1.3	2.2	2.2		Cu.-N.	S		Ω <sup>2</sup> p.	
24.	58.58	28.4	37	21.8	63.8	17.7	SE	1.2	1.8	1.8		Variable.	S		Ω <sup>2</sup> p.	
25.	59.01	28.5	36.4	21.7	66.3	18.7	SE	.3	2.2	2.2	Ci.	Cu.-N.	SE		Ω <sup>2</sup> p.	
26.	59.45	28	36.7	21.3	71	19.3	S	.5	3	3		Cu., Cu.-N.	S			
27.	59.67	27.9	37.7	21.4	67.5	18.4	SE, SW	.3	2.8	2.8		Cu.	SE, S			
28.	59.16	28.2	38.1	20.5	67.5	18.5	SE	.5	2.3	2.3	Ci.	Cu.-N.	S			
29.	58.75	28.6	37	21.1	66.3	18.6	SE	.3	2.5	2.5		Cu.	ESE			
30.	57.74	28.8	39	22	66	18.6	Variable	.5	3	3	Ci.-S.	Cu.-N.				
Mean	759.27	28.2	37.2	22.1	69.7	19.1			.8	4.2						
Total														25.2		

## Meteorological data for first and second class stations—Continued.

## APARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total move- ment in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	A.-Cu.	S, W	S.-Cu., Cu.-N.	mm.	
1.	760.25	26.7	32	23.1	78.3	20.2	S	375	2.8					
2.	59.49	26	31.6	22	77.7	19.4	Variable	252	0					☉ a.
3.	59.42	25.7	30	21.6	80.2	19.4	W, NE	243.6	2.8	Ci.	S	Cu.-N.	SE	☉ a.
4.	59.56	26.5	31.2	22.5	78.7	20.1	SW, NE	270.6	.3	Ci.-S.	SW	S.-Cu.		☉ a.
5.	59.22	26.8	33	22.1	72.7	18.8	S, NE	275.2	.3	A.-Cu.	W	S.-Cu.		☉ a.
6.	58.50	26.8	32.1	23.6	78.2	20.3	S quad.	207.3	1.2	Ci.		Cu.	S	☉ a. ☉ a. p.
7.	58.59	26.7	30.5	22.9	76.8	19.9	NE	146.8	3.5			S.-Cu.	E	☉ a. p.
8.	58.97	26.8	32	23.1	78.2	20.3	NE	202.2	1	A.-Cu.		S.-Cu.		☉ a. ☉ a. p.
9.	59.27	26.5	31.5	22.4	81.8	20.9	Variable	185.9	1.3			Cu.-N.	E	☉ a. ☉ a. p.
10.	59	26.6	31.6	22.6	72.5	18.6	Variable	285.4	3.3			S.-Cu.	W	☉ a. p.
11.	59.04	26.6	32.2	22.1	77	19.8	Variable	204	.3	Ci.	W	Cu.-N., S.-Cu.	W	☉ a. p. ☉ p.
12.	59.66	26.4	32.7	22.1	80.5	20.4	S quad.	259.1	2			Cu.-N.	S	☉ a. ☉ a. p.
13.	59.28	27.2	32	23.1	77	20.5	SE quad.	311.3	2	Ci.	W	S.-Cu.	W	☉ a. ☉ a. p.
14.	59.28	27.6	33.4	23.6	77.2	21.1	S	386.8	2.7	Ci.	W	S.-Cu.	SW	☉ a. p. ☉ p.
15.	58.74	27.2	31.5	24.1	82.8	22.1	N quad.	212.9	3	Ci.	W	Cu.-N.		☉ a. ☉ a. p.
16.	58.58	26.6	31	23.1	81.5	21.1	Variable	203.1	1.8			S.-Cu.	E, SW	☉ a. ☉ a. p.
17.	59.19	26.1	31.4	20.6	83.3	20.9	Variable	294.8	5	Ci.-S.		S.-Cu.	NE	☉ a. ☉ a. p.
18.	60.42	25	30.6	21.1	84.2	19.8	E quad.	226.1	9	A.-Cu.	SW	S.-Cu.		☉ a. ☉ a. p.
19.	60.20	25.3	29.4	21.6	85.8	20.7	Variable	165.7	8.3	Ci.-S.		Cu.-N. SSE, SE		☉ a. p. ☉ p.
20.	60.09	26.5	32	22.4	82.5	21	Variable	221.8	6	Ci.-S.	W	Cu.-N., S.-Cu.		☉ a. p. ☉ p.
21.	59.60	26.9	32.8	22	83.3	22	SW, NE	291.8	1	Ci.-S.	W	S.-Cu., Cu.-N.		☉ a. p. ☉ p.
22.	59.59	27.5	33.5	23	78.5	21.4	S	318.5	.2	Ci.-S.		S.-Cu.		
23.	58.65	27.6	33.6	23.6	75.7	20.8	SE quad.	283	.2	Ci.-S.		S.-Cu.		
24.	58.48	27.4	33	22.3	71.3	19.2	E, S	248.8	.3			Cu.-N.	S	☉ p.
25.	58.78	27.5	33	23.5	71.3	19.3	S	283.8	.8			Cu.-N.	S	
26.	59.42	27.2	31.9	23.6	74	19.8	SE quad.	280	.8			Cu.-N.	SE	
27.	59.70	26.9	32.5	22.6	74.5	19.5	E quad.	190.2	.7	Ci.-S.	SW	Cu.-N., S.-Cu.		☉ a.
28.	59.22	26.8	32	21.5	75.2	19.5	E quad.	229.8	.3	Ci.-Cu.		Cu.-N.	S	
29.	58.80	26.8	32	21.9	76.8	20	Variable	200.1	.7			Cu.-N.		☉ a.
30.	57.53	27.3	32.5	22.1	78	20.8	NE, S	228.6	1.7	Ci.-S.	W	Cu.-N., S.-Cu.		☉ a. ☉ p.
Mean	759.22	26.7	32.0	22.5	78.2	20.3		249.5	2.1					
Total								7,484.2					51.3	

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, APRIL, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan				5.6	.8									5.1	4.8	1.8
Zamboanga	2.5			.5										2.3	2.3	8.1
Davao	15	10.9			5.8	2.5	13.7			20.3	10.4				2.8	23.4
Cotabato	20.6	1.5	.3	19.8					1.8				2	21.8	.5	36.1
Cagayan, Misamis										3.6			.5	2	21.6	7.1
Butuan	2.1			.3	5.6	.5	2.8		37.3	9.6	4.3		33.8	17.3	14	.8
Dumaguete				.8	1.1		.7					4.1	1	7.9	.5	2.1
Yap, W. Carolines						4.6			58.2	9.9	44.2	.3	10.4	4.9	3.6	2.3
Maasin				15.2					7.6		9.1	7.1				
San Jose Buenavista							1							1	1.5	.5
Cuyo							3.3								1.3	20.6
Borongan		.8	2.8		1.3	1			1.3	8.4	92.7	101.1	9.4	38.1	4.6	10.2
Masbate												46.7	2.8		19.3	14
Romblon				1.8		2.8				2	1	11.9	.8	.3	7.4	
Batag									5.1	10.4	26.4	25.2	5.8	3	9.9	
Gubat				12.2	2.8	2			3.6		12.9	5.1		19.1	2.3	
Sumay, Guam									.6			1.3		.6		
Calapan						4.3	.5	2.3					37.8			
Virac		.5			4.1	5.6					4.6	62.2	73.4	72.6	.6	.5
Nueva Caceres													8.3	1.7	7.5	
Batangas												11.2	5.1	2.8	15.5	
Silang														3	36.5	7.6
Santa Cruz, Laguna														.3	33	1.8
Antipolo															1.8	12.4
Iba											.8	2.3			1.4	70.4
Tarlac															52.8	44.4
Baler												5.3	82.1	104.4	2	1.3
San Fernando, Union																
Echagüe													.5			
Candon																
Laoag																
Santo Domingo, Batanes			59.7										48.3			

Station.	Day of month.																
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	Total.	
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Isabela, Basilan	18.4	23.1			1.3			2.6			11.6			.5		126.6	
Zamboanga	.5			18.3				4.6		8.1		.8				50.4	
Davao	3.6	1			4.6			2								26.9	
Cotabato			3.3		3.8		11.7	14.5					7.6	9.9		155.6	
Cagayan, Misamis	1.5	5.1	18.5	11.9	1.3	.2	.5		12.7	29.7	2			.3		188.1	
Butuan	.5						.5			2.8						38.6	
Dumaguete	27.7	9.6		1.5	2	5.1	3.1	.3	11.4	12.7	1	39.4				242.2	
Yap, W. Carolines	2								2.3	.8	2.8					26.1	
Maasin	3.3	1	11.7		10.4	.5		.3	24.6	12.7	.5	10.7			13.4	227.5	
San Jose Buenavista				7.1					8.6	14.7		6.9				76.3	
Cuyo	10.4	1			26.4											41.8	
Borongan	1													1		27.2	
Masbate	2	.5		9.4	.6	14.2	6.6	9.4	4.5	3.5	25.6	2.3	14	2.3		366.6	
Romblon		.5							.8	.8						84.9	
Batag		18						7.9	5.8			2.5				62.2	
Gubat				2			2.5	15.3		4	6.1	1.8				117.5	
Sumay, Guam				1.8	1	2.8	1.5	2.5		4.3	3	3				79.9	
Calapan	3.8				1.9	1.3			8.3							17.8	
Virac		2.8	12.4	6.1	8.9	26.4	3.6		3.6	5.1	.3	6.8	.3			121.2	
Nueva Caceres			1.5	.6	3.8	25.1	3.3	3	2	1.6	1.5	5.6	.5			272.6	
Batangas	30.2	3.8										1.1	.1			55.1	
Silang	4.8	17.5	.8													57.7	
Santa Cruz, Laguna	4.8		10.4						2	.8						65.1	
Antipolo	7.1	3.6		.3				1	2.3	.3	.5	.5	.3			55.8	
Iba	2	29.5														45.7	
Tarlac	2.5			.3					.1							78.8	
Baler		2.3	1.3													112.2	
San Fernando, Union	7.1	49.8	2.3	35.3	7.9	9.7	10	2	.1	13.5	2	12.2	22.4	.8		370.2	
Echagüe	18.8	4.1							1							23.9	
Candon		7.6							.3	.3						8.7	
Laoag	1.3									6.9						8.2	
Santo Domingo, Batanes	.4			15.7							1					0	
																125.1	

## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, APRIL, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Butuan.		Dumaguete.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1.	29.9	21.7	31.1	22.5	28.9	23.5	31.2	21.9	33.1	23.8	24.9	29	23.6	29.6	24.4	
2.	30.5	22.8	24.1	22.5	31.1	23.9	31.5	21.4	33.4	32.4	20.9	30.6	21.1	29.8	23.1	
3.	31.2	21.6	31.6	22.6	31	22	33.7	21.6	33.9	31.7	23.2	30.5	22.8	29.7	23.5	
4.	30.8	21	31.7	21.6	31	21.1	30.2	21.8	33.3	30.7	23	28	23.2	29.5	23.1	
5.	32.2	21.1	31.9	22.6	30	23	31.2	21.5	30.4	31.1	23.2	29.7	22	29.9	23.8	
6.	31.6	21.7	29.6	22.5	30.1	23	28.2	20.2	29.8	30.9	23.2	30.6	21.9	29.4	24.5	
7.	31	20.6	31.6	20.3	30.8	22	30.7	22.1	33.3	31.8	22.2	30.3	22.8	30.6	23.6	
8.	33.2	21.8	30.6	21.9	29.4	22.6	32.7	21.8	34.8	31.6	23.7	30.5	22	29	24.5	
9.	32.1	21.5	31.6	22.1	29.1	22.9	33.7	21	34.5	31.9	21.2	29.7	22	29.5	22.7	
10.	31.9	21.9	31.6	22	31	22.1	32.7	22.1	33	31.6	23	26.7	23.5	30.8	24.8	
11.	32.6	21.6	30.8	22.1	32.3	23	32.1	21.9	33.6	31.6	23.9	27.8	24	31	23.5	
12.	32.5	21.8	31.6	22.4	29.5	22	32.2	23.2	35	32.4	24.1	30.1	24	30.7	24.5	
13.	33	21.5	31.8	22.9	29.5	23.7	31.7	24.4	35.1	33	24	31.5	23.5	30.2	24.3	
14.	33.9	21.5	32.6	21.5	30.1	23.4	32.7	22.3	34.5	32	22.5	30.7	22.9	29.5	25.2	
15.	30	23	30.6	23.1	28.1	23.9	32.4	22.5	33.7	31.8	22.2	31	23.6	30.2	23.1	
16.	29.9	21.8	31	22.1	30.1	22.6	32.5	23.5	34.8	31.1	22	31	22.9	29.8	24	
17.	30.2	22.3	31.8	21.5	30	22.5	32.4	22.6	33.2	30.7	23	30.7	23.4	29.2	24.3	
18.	29.9	21.1	32.1	22.4	30	23.5	32.2	22.1	34.1	31.5	22.9	29.8	23.1	29.8	24.1	
19.	31.5	22.1	32.6	22.6	31.9	22.5	32.7	21.2	33.6	33.6	22	31.2	23.1	31.8	24.8	
20.	32.8	21.5	30.6	21.6	31	23.6	32.7	21.2	33.8	33.5	22.5	31.2	23	30.1	26.4	
21.	32.4	21.5	32.4	21.9	32	22.6	27.6	22.9	31.4	34.8	23.5	29.1	24	30.5	26.2	
22.	32.5	22.4	34.6	22.9	31.5	23.5	32.7	22.3	34.2	31.9	23	31.1	22.8	29.7	26.1	
23.	33.4	22.5	32.9	22.6	31.3	23.6	33.9	21.5	34.8	32.6	23.3	29.8	23	29.5	24.1	
24.	32.7	22	32.1	22.6	33	23.8	30.7	23.5	32.8	31.1	23.7	31.1	23.6	30.6	25.5	
25.	30.8	23.5	33.1	23.3	31	23.5	32.2	21.4	34	32.9	22	29.2	23.2	30	25.8	
26.	31.4	22.3	33.6	22.6	31.3	23.4	32.2	22.1	33.6	31.5	23.7	26.1	23.4	28.7	25.7	
27.	29.3	22.4	33.6	23.1	31.4	23.8	33.3	21.1	33	32.2	22.8	28	22.8	30.7	24.8	
28.	31.5	21.7	34.6	22.1	32.4	23.5	32.7	21.8	34.5	32.5	22.7	31.5	23	31.2	24.8	
29.	33.1	22.3	31.1	22.1	31.1	23.5	32	22.8	33.9	32.2	23.2	29.6	23.2	31.3	25.2	
30.	32.4	23.7	31.6	22.4	31.7	24	27.7	22.9	32	33.3	24.2	29.3	24.2	31.8	25	
Mean	31.7	21.9	31.7	22.3	30.7	23.1	31.8	22.1	33.5	32.2	23	29.8	23.1	30.1	24.5	

Day.	Yap, W. Carolines.		Maasin.		Cuyo.		Borongan.		Masbate.		Romblon.		Batag.		Gubat.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1.	31.7	24.5	32	22.2	32.6	26 ?	30.9	25.2	23.5	34.8	24.1	30.9	23.5	30.5	25.2	
2.	31.8	24.7	32	21.7	31.8	25.5	31.3	22.1	23.5	35.1	24.4	30.9	23	30.2	24	
3.	30.5	24.9	32.1	21.7	32.3	25.4	31	20.2	24.5	34.3	24.2	31.5	22.6	30.9	24	
4.	32.5	24.6	32.1	23.4	32.3	25.6	31.2	21.9	24.6	34.3	24.1	31.6	22.1	30.2	23.4	
5.	32.2	24.9	32.1	22.1	31.6	25.9	29.8	20.5	23.2	34.4	24.5	31	22.5	31	22.2	
6.	31.3	24.3	32.1	22	32.2	24.4	30.5	20.5	23.8	34.1	21.3?	31.4	21.5	30.5	22.5	
7.	31.7	23.2	31	21.5	32.4	23.4	30.7	21	24.6	35	23.6	22.2	31.4	22.9		
8.	33.6	25	32.2	21.4?	32	24.5	31	19.7	24.2	34.8	23.4	30.5	21.2?	30.9	24	
9.	32.7	24.7	32.1	21.5	32.6	24.1	30.8	20.3	24	35	22.3	30.5	22.4	31.4	24.2	
10.	31.8	23	30	21.4	31.9	24.7	30.6	22.3	24.8	35	23.4	30	22.9	30.8	24.6	
11.	30.8	23.4	29.6	21.5	32.2	26.1	29.7	22.4	24.8	35.4	24	29	21.8	30.7	24.5	
12.	31	23.5	30.3	22.4	32.3	26.4	27.1	23	25.5	34.1	24.4	26.5	21.6	28.7	24	
13.	32	25	30.4	22.5	33.8	26	28.2	22.6	24	31.4	23.4	28	21.5	29.7	25.5	
14.	31.2	23.5	30.9	24.6	30.6	25.7	28.5	23.2	25.6	32.9	24.4	29	22.9	30.4	24.4	
15.	31.7	24.7	31	23.7	31.6	24.1	28.6	23.6	24.4	33.5	24.6	29.6	22	30.6	22.8	
16.	31.2	25.2	30.9	23.8	31.4	24.3	30.8	22.6	25.2	33.5	24.8	29.8	21.9	31	22.7	
17.	31.2	25	31.9	23.7	31.7	24.2	30.3	22.5	33	33.5	23.4	29	22.4	31.2	23.9	
18.	32.6	23.2	32	23.8	32	24.4	31.2	22.6	25	33.5	23.2	29.5	22.9	30.5	23.5	
19.	31.7	25	32.1	23.8	32.7	24.5	30.5	22.8	25.2	34.6	24.2	30	23.4	30.9	24.5	
20.	31.3	23.4	32	23.4	32.7	26.3	30.8	21.6	33	25.2	34	24.9	30	22.7?	31	
21.	31.4	24.8	32.2	23.4	33.3	25.9	30.5	23.6	32.4	25.6	34.4	24.7	30	23.1	30.9	
22.	31.4	23.1	32	23.4	33.2	25.2	31.1	22.9	34	25.2	34.6	25	30	23.2	30.9	
23.	31.6	25	32.1	23.8	33.3	26.3	30.8	22.7	32.2	25.5	34.1	25.5	30.5	22.5	30.5	
24.	31.7	25.2	32.1	23.4	34	27.1	30.9	24.1	33.2	25.4?	34.8	25.2	29.5	22.6	31	
25.	31.6	25.5	32	23.3	33.6	26.8	30.8	23.5	33.5	25.5	33.7	24.8	30	22.4	30.2	
26.	32.3	25.6	29.5	23.2	33.6	26.5	31	23.8	32.6	25.2	34.2	25.4	30	23.9	31	
27.	28.7	23.5	32	23.6	32.8	26.6	30.7	24	32.5	24.6	33.8	25.3	30.4	21.9	31.4	
28.	30.7	24	32.4	23.4	32.6	26.6	30.9	23.6	33	25.6	33.9	25.2	29.9	23.2	29.9	
29.	27.7	24	32	23.4	31.8	26.9	30.3	25.1	32.2	25.6	34.5	25.2	30	22.9	31.2	
30.	32.2	23.6	32.5	23.4	32.8	26.4	30.8	22.7	33	24.8	34.6	25.4	30	23	31.1	
Mean	31.5	24.3	31.6	22.9	32.5	25.5	30.4	22.6	32.9	24.8	34.2	24.2	30	22.5	30.7	24.4

Maximum and minimum temperatures for third-class and rain stations, April, 1913—Continued.

Day.	Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.		Sta. Cruz, Laguna.		Antipolo.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30.6	24	30.7	22.3	31.6	-----	34.4	17	34.8	22.8	31.2	19.4	32	21	34.4	21.3
2	29.4	24.4	31.5	22	31.7	-----	32.5	15.7	35.8	21	31.5	20.3	31.9	20.1	34.9	18.4
3	31.4	24.2	32.7	20.6	32.5	-----	33.5	18	34.9	20.6	31.8	19.6	32.6	19.6	35.4	19.8
4	29.4	24.4	31.6	24.6	31.5	-----	33.8	16	34.3	20.6	31.6	20	31.9	19	34.5	19.8
5	29.4	23.8	32	22	30.4	-----	32.5	16.3	35.7	21.4	32	20.3	32.1	19.5	34.7	19.5
6	31.2	25	31.1	19.6	31	-----	31.7	18.3	34.3	20.1	32.2	19.5	32.3	18.5	34.8	19.5
7	30.3	25	31.9	21.6	31.1	-----	34.5	19	34.4	22	31.4	20.5	33.1	20.9	34.6	20.6
8	31.8	25.8	31.5	22.1	31.4	-----	34.6	18.9	34.8	22.9	31.5	19.4	33	22.4	36	21.7
9	30.2	25.2	32	21.5	32.5	-----	33.9	15.5	34.9	21	31.8	19.7	32.4	21.5	35.5	20.8
10	30	24	32	22.4	34	-----	33.9	18.7	34.1	22	32.4	20	33.1	21.5	36.3	19.7
11	31.4	23	34.4	23	29.8	-----	33.3	17.9	35.1	22.9	32.5	19.3	32.6	22.6	35.8	22.7
12	31.2	24.4	33.4	22.1	28	-----	32	20.2	33.4	21.6	31.8	20	32.5	23.6	35	21.7
13	31.7	24.4	32.6	25.8	28	-----	27.8	21.6	33	23.4	31.5	19.5	33.1	23	35.3	22.7
14	30.8	24.2	31.1	24	28.4	-----	32	21.5	32.3	24.2	32.4	19.3	31.1	23.8	35	24
15	31.6	25	32	23.1	30	-----	33.5	20.5	31.1	23	32.2	19	31.6	23	34.3	23.2
16	31.3	25	32	22.5	31.5	-----	33.1	21.2	31.8	23.3	29.1	20.1	32.5	23	34	22.7
17	30.4	25.2	31.2	23.3	32	-----	34.9	22.2	33	24	30.5	19.4	32.4	23.1	35.4	23.3
18	31.4	25.6	30.6	23.5	31.9	-----	31.7	21	32.3	23.9	31	20	31.4	23.5	32.7	23.2
19	31.4	25.3	31.1	22.2	31.7	-----	34.1	20.8	33.2	23.3	31.6	20.2	33.2	23.5	34.3	23.2
20	31.3	25.5	31.6	22.6	32	-----	33.5	20	32.6	24.1	30.6	19.8	33.1	23.1	33.3	22.2
21	31.7	24.6	31.5	23.2	30	-----	34.6	19.5	34.7	23.7	30.9	19.9	32.8	23.6	34	23.4
22	30.8	24.5	31.6	23.1	31.8	-----	34.1	19.2	33.6	23.6	31.3	20.1	33	24	35.5	23.2
23	30.8	24.5	31.4	22.5	32.2	-----	34.4	19.2	34.4	24.2	31.8	20	31.4	23.2	34.2	23.1
24	31.2	25.6	31.5	24.5	31.4	-----	34	19	34.3	23.9	32.2	20.3	31.9	23.8	34.3	22
25	30.3	25.2	31.6	26.2	31.6	-----	33.3	19.5	34.2	25.1	31.7	19.5	31.5	24	34	22.6
26	30.6	25.2?	31.5	25.2	32.1	-----	33.9	19	34.4	24	31	19.2	32.4	24.2	34	23.2
27	30.8	25.7	31.5	25	32.3	-----	33.6	19	34.2	23.4	30.1	19.9	32	24.4	33.7	22.7
28	30.3	25.2	31.4	26	32.5	-----	31.5	18.6	34.8	23.5	30.8	19.5	32.2	23.8	34.8	22.4
29	30.8	24.8	32.1	25	33	-----	34.1	19.8	35.3	24.8	32	20	32.2	24	35.2	22.5
30	30.3	25.8	31.2	23.8	32.3	-----	34	19.9	35.8	23.3	32.2	20.3	32.5	23.2	35.8	23.4
Mean	30.8	24.8	31.7	23.1	31.3	-----	33.3	19.1	34	22.9	31.5	19.8	32.3	22.4	34.7	21.9

Day.	Iba.		Tarlac.		Baler.		San Fernando, Union.		Echague.		Candon.		Laoag.		Sto. Domingo, Batanes.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	34.2	23.9	36.2	23	30.3	21.4	32.5	25.1	33.9	21.3	30.8	23.9	33.5	22.2	30.8	23.9
2	31.9	19.5	33.5	17.9	29.9	18.5	32.3	23.2	34.5	16.5	30.6	24.2	32.4	23.1	30	21.8
3	32.4	20	37.5	20.8	30.5	18.3	31.7	23.1	34.3	17.9	30.4	22.4	32.4	19.1	29.5	21.8
4	32	19.3	36.2	20.1	30.7	20.3	34.1	22.5	35.9	18.8	30.5	21.9	32.5	19.5	30	22.4
5	32	20.2	36	19	30.8	18.9	33	24.3	34.4	17.7	30.6	21.9	32.6	20.2	29.6	23.4
6	32.2	20.6	36.4	20.2	31.3	19.1	32.6	22.6	34.7	17.9	30.4	23.8	32.6	21.2	29.5	23.4
7	32.2	19	37	20.8	31.8	19.1	31.7	22.2	35.4	17.6	31	23.4	33.3	21.2	28.8	22.5
8	33.1	20.5	37.2	22.6	32.1	20.9	32.4	22.3	35.9	19.5	31.9	23.2	33.4	23	29.9	22.2
9	32.5	20.7	36.2	23.3	31.3	19.3	32.2	24.3	35.3	17.8	31.2	24	35.5	23.4	31.2	22.5
10	32.7	20.5	38	20.1	31.7	20	33.5	24.6	35.5	18.4	31.2	25.4	33.4	24.7	30.3	23.4
11	33.2	21.9	38	22.5	32	20	32	23.8	36.4	19.8	31.6	24.5	32.7	21.6	30.6	23.4
12	33	21.8	37.3	19.9	-----	22.2	32.6	23.7	33.9	20.5	31.7	25.4	33.9	22.1	31	23.4
13	33.5	22.5	36	23.2	-----	23.7	33.1	24.6	34.5	21.1	31.6	24.5	33.9	22.7	30.4	22.2
14	34.5	23.5	38	23	-----	23.5	32.4	24.1	35.3	22.9	31.8	25	34.5	23.5	30.5	24
15	32.9	24.3	34	22.5	-----	23.6	33.6	24	35.1	22.4	31.9	25.5	33.2	24.4	30.1	24
16	32.4	21.9	36	21.5	-----	22.2	32.8	23.2	35.6	20.7	32	26	32.8	23.5	29.3	22.3
17	31.1	23	34.3	20.5	-----	23.3	33.4	23.4	37.1	23.3	32.1	24.4	33.4	23.2	28.4	22.8
18	32	23.5	35.2	20.2	-----	23.2	32.4	21.9	29.8	22.2	31.6	25.5	34.3	23.5	27.6	22.8
19	31.8	22.5	32.5	22.5	-----	22.4	29	22.4	30.6	21.3	29.9	24.7	31.9	22.5	28.9	23
20	33	21	32.5	22.3	-----	22.6	32.4	21.9	34.8	21.7	32.4	25.9	34.9	23.4	31.2	23.4
21	36.4	21.8	34	22.3	-----	22.9	34.6	22.4	35.4	20.5	31.4	24.5	33.6	22.1	31	24
22	34.8	23.5	34.8	21.8	-----	22.2	34.6	23	35.6	20.7	32.3	24.6	33.5	23	32	24.6
23	34.5	23.3	34.2	21.6	-----	22.4	34.8	22.8	35.2	20.3	32.3	25.5	35.1	23.1	31	24.3
24	34.5	23	33.4	20.9	-----	22.7	34.6	22.1	34.9	20	32.4	24.4	35.1	23.4	31.4	24
25	35.5	21.5	36.2	21.6	-----	23.3	34.1	22.5	36	20.7	32.4	25.4	33.9	23.1	31.4	24.4
26	33.9	23.8	36.2	21.4	-----	23.1	33.8	22.6	35.2	20.5	32.5	24.6	33.8	23.3	31.3	24.5
27	33.5	21.5	36	22.3	-----	22.2	33.3	22.6	34.9	20.5	31.6	24.5	35.3	23.4	31.4	24.3
28	33.8	23.2	36.4	22.5	-----	22.8	33.2	21.8	35.3	20.4	31.6	25	35.3	23.6	31	24
29	33.9	20.5	37.2	20.6	-----	22.6	33.5	22.2	36.5	20.1	32.4	24.7	35	23.5	30.8	23.8
30	35.1	22.3	36.9	20	-----	23	34.7	23.5	36.3	20.9	32.5	24.6	34.5	24.5	31.3	23.8
Mean	33	21.8	35.9	21.4	31.1	21.7	33	23.1	34.9	20.1	31.6	24.4	33.7	22.7	30.3	23.3



# SEISMOLOGICAL BULLETIN FOR APRIL, 1913.

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By Rev. MIGUEL SADERRA MASÓ, S. J.,  
*Assistant Director of the Weather Bureau.*

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## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

17, 12<sup>h</sup> 32<sup>m</sup> 02<sup>s\*</sup> [17, 20<sup>h</sup> 32<sup>m</sup> 02<sup>s</sup>]. Central and E Mindanao. Earthquake felt in the Provinces of Misamis, Lanao, Cotabato, Davao, Agusan, the southern part of Surigao and along the eastern coast. The meizoseismic area, within which the intensity was greater than VII, included part of the coast and the interior between parallels 7.5° and 8.5°. The isoseismal V included Davao, the Agusan Valley, and the southern part of Surigao. The origin of the earthquake must, therefore, be placed in the Pacific Ocean close to the coast of Mindanao and on the western side of the great deep sounded by the "Planet." This earthquake was recorded on all the seismographs of the Far East and on many in Europe.

## GREAT SEISMIC PERIOD IN THE NE OF MINDANAO.

18, 13<sup>h</sup> 15<sup>m</sup> 18<sup>s\*</sup> [18, 21<sup>h</sup> 15<sup>m</sup> 18<sup>s</sup>]. Earthquake of intensity VII–VIII in the northern part of the Agusan Valley and in the center and S of the Province of Surigao; it was also perceptible with less intensity as far south as Davao and as far as Cotabato and Misamis in the SW and W. This earthquake was the beginning of a seismic period that caused great consternation to the people of the district and made them fear some tremendous catastrophe. From the 18th to the 30th of April the shocks were almost innumerable daily, many of them being almost as intense as the one on the 18th. In the report received from the station at Surigao there were 63 between III and VII of the scale and in Butuan 101. It must be noted that in both stations the shocks of less intensity were much more numerous. The towns on the eastern shore of the Bay of Butuan as far as Jabonga to the S of Mainit Lake experienced two weeks of almost constant earthquakes, and according to letters received, the same can be said of the towns on the Pacific coast farther south. Nevertheless there were not, as far as we can learn, any great damage done or lives lost, as the intensity of these earthquakes was less than number VIII. Below is a summary of the lists of earthquakes received in the reports from Surigao, Butuan, and Tandag. The list of this latter place begins on the 24th on account of the absence of the reporter. The arabic number expresses the number of earthquakes and the roman number the intensity, for example 2III means two earthquakes of intensity III.

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<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs of the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observer who sent the report. All time indications are in Greenwich mean time (Midnight=0h), insular time being added in brackets for the convenience of Philippine readers.

Day.	Surigao.	Butuan.	Tandag.
18	1VII	1VII-VIII, 1IV	1VII-VIII, many of III.
19	1VI, 4V, 1III	1VI, 4V, 2III	
20	3III	3III	
21	1IV	1IV, 2III	
22	0	1III	
23	0	0	
24	2VI, 1V, 5IV, 17III	1VII-VIII, 4V, 8IV, 15III	1VII-VIII, 27III-VI.
25	4III	2IV, 8III	12III-IV.
26	4V, 3IV, 6III	4V, 8IV, 11III	6VI, many III-V.
27	2IV	2V, 4IV, 5III	1VIII, 6III-V.
28	1IV, 2III	2IV, 4III	2VI, 3III-V.
29	2IV, 3III	2V, 2IV, 3III	1VIII, 2VI, 2III.
30	0	2III	2III.

The epicenter of these earthquakes appears to have been close to the eastern coasts of the island, more to the north than that of the 17th. The preceding lists seem to show that Tandag was nearer to the seat of origin than the other two stations. Moreover, the first earthquake at 13<sup>h</sup> 15<sup>m</sup> 18<sup>s</sup> of the 18th was in Kantilan, a little farther N, of much greater intensity, in that it threw down heavy statues and damaged the walls of the church, none of which things happened in Tandag nor in Butuan and Surigao. It was also stated above that, according to a letter from Tandag, the earthquakes were also felt with the same intensity and frequency in the towns along the coast to the south, at least as far as Hinatuan, which is close to parallel 8°. Consequently there is good foundation for placing the epicenter in the Pacific at some distance from the coast in about parallel 9.5°. In this supposition Kantilan and Tandag were some 107 kilometers distant from the epicenter to the WSW, Surigao 167 kilometers to the WNW, and Butuan 164 kilometers to the SW.

Some of the principal shocks were also felt in the stations in Leyte, more than 250 kilometers distant to the NW. The seismographs in the Manila Observatory registered 32 of the more intense earthquakes; the instruments in Taihoku, 14; Zikawei, 18; and those in Osaka, 13. The principal waves of some of the shocks also appear to have been registered in Europe. In the Seismische Aufzeichnungen of Aachen, Germany, for April, we find 11 disturbances which correspond to several of the principal shocks registered in Manila.

*Conclusion.*—It is very probable that both the seismic period of April 18–30 as well as the earthquake of the 17th were intimately related to the great “Philippine deep.” Last month, in speaking of the earthquakes of Sangir, Siao, and Talaut, the probability of the relation was mentioned. And it certainly appears very significant that in the short space of a month there should have been three series of earthquakes close to the western edge of this deep, all within a length of a trifle more than 550 kilometers, so that it seem imperative that there should be some relation between them and some fracture or gigantic slide on the steep western slope of the “deep.”

17, 21<sup>h</sup> 48<sup>m</sup> 53<sup>s</sup>\* [18, 5<sup>h</sup> 48<sup>m</sup> 53<sup>s</sup>]. **W of Luzon.** Oscillatory earthquake, of intensity III and direction WSW–ENE, which was felt in the stations of Cape Bolinao and Baguio. Its origin was very probably close to the NE coast of the Lingayen Gulf.

18, 18<sup>h</sup> 48<sup>m</sup> 42<sup>s</sup>\* [19, 2<sup>h</sup> 48<sup>m</sup> 42<sup>s</sup>]. **NE of Luzon.** Earthquake of intensity IV–V and direction N–S, felt throughout the province of Cagayan. Its epicenter appears to have been close to the extreme NE of the Island of Luzon. It was very weakly registered in Taihoku (Formosa).

22, 20<sup>h</sup> 52<sup>m</sup> [23, 4<sup>h</sup> 52<sup>m</sup>]. **Ormoc (W of Leyte).** Oscillatory earthquake of intensity IV–V, direction W–E, and of 10 seconds' duration. Its epicenter was in the Bay of Ormoc toward the WSW, where there exists a hypocenter of slight depth.



## RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0<sup>h</sup>. Instrument: Wiechert seismograph; 1,000 kilograms.  $A_N$ :  $T_0=6.2$ ,  $\epsilon=2.21$ ,  $\frac{r}{T_0^2}=0.055$ ;  
 $A_E$ :  $T_0=6.4$ ,  $\epsilon=2.64$ ,  $\frac{r}{T_0^2}=0.034$ . Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
102	2-3	I <sub>r</sub>	e L F	h. m. s. 23 57 54 0 01 23				Southwestern Formosa.
103	4	I <sub>v</sub>	eP L F	13 37 00 39 30 52				
104	7	I <sub>r</sub>	eP S L M <sub>N</sub> F	13 53 14 57 42 14 02 17 04 52 45	7	11		
105	7	I <sub>r</sub>	e F	17 06 31				
106	8	I <sub>r</sub>	eP M <sub>N</sub> F	2 26 28 34 50 53	11	12		
107	9	I <sub>d</sub>	eP F	2 59 41 3 02				
108	9	I <sub>r</sub>	eP L M <sub>E</sub> F	18 11 47 15 27 17 20 47	6		15	
109	10	II <sub>v</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	15 31 42 32 00 32 18 32 34 46	2-3 3-4	342 450		
110	10-11	I <sub>r</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	23 11 00 14 35 16 00 18 22 0 22	11 9-10	25 48		
111	11	I	e F	9 32 37 58				
112	11	I <sub>r</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	14 55 00 58 22 15 01 49 02 20 16 01	11-12 8-9	16 52		Southern Formosa.
113	13	I <sub>r</sub>	e M <sub>E</sub> F	6 45 00 51 15 7 31	11		40	
114	14	I <sub>v</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	7 50 36 52 38 53 07 54 49 9 18	8 9	88 123		
115	17	I <sub>d</sub>	eP F	12 01 00 03				Central and E of Mindanao.
116	17	I <sub>v</sub>	eP L M <sub>N</sub> F	12 32 02 33 52 35 46 13 42	6	219		
117	17	I <sub>d</sub>	eP F	14 50 09 53				
118	17	I <sub>v</sub>	eP F	21 48 53 52				W of Luzon.
119	18	II <sub>v</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	13 15 18 16 53 18 00 18 32 14 50	5 6-7	404 575		NE of Mindanao.
120	18	II <sub>v</sub>	eP L M <sub>N</sub> F	18 48 42 49 24 50 14 19 03	3-4	175		NE of Luzon.

## Records of the microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
121	18	III <sub>v</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	h. m. s. 19 04 25 05 50 07 23 07 36 20 35	14-15 9	1,296	1,254	NE of Mindanao.
122	19	I <sub>r</sub>	e F	22 07 00 22				
123	20	I <sub>v</sub>	eP F	3 39 00 55				NE of Mindanao.
124	20	I <sub>r</sub>	e F	10 15 25				
125	20	I <sub>d</sub>	eP F	11 12 22 16				
126	20	I <sub>d</sub>	iP F	16 58 55 17 01				
127	21	I <sub>v</sub>	eP L M <sub>N</sub> M <sub>E</sub>	12 33 22 35 16 37 19 38 31	11 10	26	37	NE of Mindanao. End overtaken by following earthquake.
128	21	I <sub>r</sub>	e L M <sub>N</sub> M <sub>E</sub> F	13 02 48 05 18 06 47 08 00 55	10-11 9	24	39	
129	23	I	eP L F	12 59 42 13 00 40 18				
130	24	I <sub>r</sub>	e L F	0 55 28 57 19 1 32				
131	24	I <sub>v</sub>	eP F	9 24 10 indefinite				NE of Mindanao.
132	24	III <sub>v</sub>	eP L F	10 17 09 18 40 12 15				NE of Mindanao.
133	24	II <sub>v</sub>	eP L F	12 17 26 19 01 14 10				NE of Mindanao.
134	24	I <sub>v</sub>	eP F	14 30 44 42				NE of Mindanao.
135	24	I	e F	18 24 18 41				
136	24	I <sub>v</sub>	eP F	20 09 00 25				NE of Mindanao.
137	24	I	e F	22 07 53 29				
138	24-25	I <sub>v</sub>	eP	23 41 20				NE of Mindanao. End overtaken by following earthquake.
139	25	I <sub>v</sub>	eP F	0 43 30 1 49				NE of Mindanao.
140	25	I <sub>v</sub>	eP F	4 33 00 5 12				NE of Mindanao.
141	25	I <sub>v</sub>	e F	6 39 09 7				NE of Mindanao.
142	25	I <sub>v</sub>	e F	11 50 02 12				NE of Mindanao.
143	25	III <sub>v</sub>	eP L	17 58 32 18 00 47				NE of Mindanao. Maximum and end not recorded owing to the amplitude of the shock throwing the pens off the record.
144	25	I <sub>v</sub>	eP F	21 02 12 37				NE of Mindanao. From the horizontal pendulums.
145	25	I <sub>v</sub>	eP F	22 52 23 23 12				NE of Mindanao.

*Records of the microseismograph—Continued.*

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
146	26	I <sub>v</sub>	eP F	<i>h. m. s.</i> 0 19 48 44	-----	-----	-----	NE of Mindanao.
147	26	I <sub>v</sub>	eP F	3 49 46 4 04	-----	-----	-----	NE of Mindanao.
148	26	II <sub>v</sub>	eP	4 08 10	-----	-----	-----	NE of Mindanao. End overtaken by following earthquake.
149	26	III <sub>v</sub>	eP F	4 23 18 6 19	-----	-----	-----	NE of Mindanao.
150	26	I <sub>v</sub>	eP F	9 55 02 10 11	-----	-----	-----	NE of Mindanao.
151	26	I <sub>v</sub>	eP F	10 41 38 58	-----	-----	-----	NE of Mindanao.
152	26	I <sub>v</sub>	eP F	11 30 03 51	-----	-----	-----	NE of Mindanao.
153	26	I <sub>v</sub>	eP F	18 53 46 19 11	-----	-----	-----	NE of Mindanao.
154	27	I <sub>v</sub>	eP F	7 59 22 8 11	-----	-----	-----	NE of Mindanao.
155	27	II <sub>v</sub>	eP F	8 14 31 9 49	-----	-----	-----	NE of Mindanao.
156	27	I <sub>v</sub>	eP F	11 22 00 35	-----	-----	-----	NE of Mindanao.
157	27	I	e F	13 01 10 22	-----	-----	-----	
158	28	II <sub>v</sub>	eP F	3 31 24 4 42	-----	-----	-----	NE of Mindanao.
159	28	I <sub>v</sub>	eP F	8 00 22 19	-----	-----	-----	NE of Mindanao.
160	28	III <sub>v</sub>	eP F	18 41 18 20 16	-----	-----	-----	NE of Mindanao.
161	29	II <sub>v</sub>	eP F	3 10 20 4 37	-----	-----	-----	NE of Mindanao.
162	30	I	e F	11 45 00 12 34	-----	-----	-----	

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

17, 12<sup>h</sup> 32<sup>m</sup> 02<sup>s</sup>\* [17, 20<sup>h</sup> 32<sup>m</sup> 02<sup>s</sup>]. Centro y E de Mindanao. Temblor de tierra sentido en las Provincias de Misamis, Lanao, Cotabato, Davao, Agusan, parte S de Surigao y en las costas orientales. El área meizoséismica donde su intensidad debió pasar de VII, comprendía parte de la costa y del interior, entre los paralelos 7.5° y 8.5° N. Así se desprende de la nota recibida de Hinatuan y de Lianga. La isoseismal V encerraba Davao, el Valle del Agusan y parte S de Surigao. Su origen por consiguiente debe colocarse cerca de la costa del Mar Pacífico en el lado occidental de la fosa sondada por el "Planet." Registráronlo todos los seismógrafos del Extremo Oriente y aún muchos de Europa.

## GRAN PERÍODO SÉISMICO EN EL NE DE MINDANAO.

18, 13<sup>h</sup> 15<sup>m</sup> 18<sup>s</sup>\* [18, 21<sup>h</sup> 15<sup>m</sup> 18<sup>s</sup>]. Temblor de tierra de intensidad VII-VIII en la parte N del Valle del Agusan y en el centro y S de la Provincia de Surigao: fué además perceptible con menor intensidad hasta Davao por el S y hasta Cotabato y Misamis por el SW y W. Con este terremoto principió un período séismico que puso en gran consternación y temor de alguna catástrofe a todos los habitantes de la expresada región. Desde el 18 hasta el 30 de Abril fueron sin número los temblores de tierra que a diario se repetían y muchos de ellos con poca menos intensidad que el precedente del día 18. En el *report* de la estación de Surigao figuran 63 temblores comprendidos entre los grados de intensidad III y VII, y en el de Butuan 101. En ambas estaciones se hace notar que los choques de menor intensidad fueron mucho más numerosos. De los pueblos situados en la costa oriental de la bahía de Butuan y del de Jabonga, al S del lago de Mainit, consta que experimentaron dos semanas de temblores de tierra; en semejantes términos se expresan cartas recibidas de otros pueblos de la costa del Pacífico situados más al S. Sin embargo no hubo, que sepamos, ruinas de consideración ni desgracias, por haberse mantenido la intensidad de los terremotos dentro del Grado VII. A continuación ponemos un resumen de las listas recibidas de Surigao, Butuan y Tandag; esta última comienza el 24. La cifra arábica expresa el número de temblores de la intensidad indicada por la cifra romana que le sigue, así por ejemplo, 2III indica dos temblores de intensidad III.

Día.	Surigao.	Butuan.	Tandag.
18	1VII	1VII-VIII, 1IV	1VII-VIII, muchos de III.
19	1VI, 4V, 1III	1VI, 4V, 2III	
20	3III	3III	
21	1IV	1IV, 2III	
22	0	1III	
23	0	0	
24	2VI, 1V, 5IV, 17III	1VII-VIII, 4V, 8IV, 15III	1VII-VIII, 27III-VI.
25	4III	2IV, 8III	12III-IV.
26	4V, 3IV, 6III	4V, 8IV, 11III	6VI, muchos de III-V.
27	2IV	2V, 4IV, 5III	1VIII, 6III-V.
28	1IV, 2III	2IV, 4III	2VI, 3III-V.
29	2IV, 3III	2V, 2IV, 3III	1VIII, 2VI, 2III.
30	0	2III	2III.

El epicentro de estos terremotos parece se hallaba también cerca de las costas orientales de la isla más al N que el del 17. Las precedentes listas de temblores parecen demos-

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.

trar que Tandag estaba más cerca del origen que las otras dos estaciones. Además el primer terremoto del 18 a 13<sup>h</sup> 15<sup>m</sup> 18<sup>s</sup> tuvo también en Kantilan mucha mayor intensidad que en Butuan y Surigao puesto que derribó estatuas pesadas y causó desperfectos en algunas paredes delgadas de la iglesia, no habiendo sucedido nada semejante en Butuan, ni mucho menos en Surigao. Se ha dicho también más arriba que según una carta de Tandag los terremotos se sintieron con la misma intensidad y frecuencia pero sin causar desperfectos a lo largo de la costa hacia el S, a lo menos hasta Hinatuan que está hacia el paralelo 8° N. No carece de fundamento el colocar el epicentro en el Pacífico algo lejos de las costas correspondientes al paralelo 9° 5' N. En este supuesto Tandag y Kantilan se hallaban a 107 kilómetros distantes hacia el WSW, Surigao 167 kilómetros al WNW y Butuan 164 kilómetros al SW.

Algunos de los principales temblores fueron perceptibles también en las estaciones de Leyte distantes más de 250 kilómetros hacia el NW. Los seismógrafos del Observatorio de Manila registraron 32 de los más intensos. Los de Taihoku 14, Zikawei 18 y Osaka 13. También parece haberse registrado en Europa las ondas principales de algunos. En el Seismiche Aufzeichnungen de Aachen, de Abril, encontramos 11 perturbaciones que corresponden a varias de las principales registradas por los aparatos de Manila.

*Conclusión.*—Parece muy probable que tanto los terremotos del período sísmico comprendido entre el 18 y el 30 de Abril como el terremoto del día 17 estuvieron íntimamente relacionados con la gran "Fosa de Filipinas." Ya el mes precedente al tratar del terremoto de Sangir, Siao y Talaut se indicó la probabilidad de que estuviese relacionado con la mencionada Fosa. De todos modos no deja de ser un hecho muy significativo que en el espacio de un mes se hayan originado tres series de terremotos cerca del borde W de esta gran Fosa, en una longitud de poco más de 550 kilómetros. Por manera que es casi imposible no relacionarlos entre sí y con alguna rotura o con gigantescos derrumbamientos ocurridos en su escarpada pendiente occidental.

17, 21<sup>h</sup> 48<sup>m</sup> 53<sup>s</sup>\* [18, 5<sup>h</sup> 48<sup>m</sup> 53<sup>s</sup>]. W de Luzón. Temblor oscilatorio, dirección WSW-ENE, intensidad III, sentido en las estaciones de Cabo Bolinao y de Baguio, su origen debía hallarse cerca de las costas NE del Golfo de Lingayen.

18, 18<sup>h</sup> 48<sup>m</sup> 42<sup>s</sup>\* [19, 2<sup>h</sup> 48<sup>m</sup> 42<sup>s</sup>]. NE de Luzón. Temblor de tierra de intensidad IV-V y dirección N-S, sentido en toda la Provincia de Cagayán. Su epicentro parece hallarse cerca del extremo NE de la Isla de Luzón; fué débilmente registrado en Taihoku (Formosa).

22, 20<sup>h</sup> 52<sup>m</sup> [23, 4<sup>h</sup> 52<sup>m</sup>]. Ormoc (W de Leyte). Temblor oscilatorio, dirección W-E, intensidad IV-VI, duración 10 segundos. Su epicentro se hallaba en la bahía de Ormoc hacia el WSW, donde existe un hypocentro de poca profundidad.



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## BULLETIN FOR MAY, 1913.





# METEOROLOGICAL BULLETIN FOR MAY, 1913.

By Rev. JOSÉ CORONAS, S. J.

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## GENERAL WEATHER NOTES.

Pressure and temperature.—The mean atmospheric pressure of the month was somewhat less than that for May of last year in all the stations. The highest pressure was observed in almost all parts on the 17th or 18th; the lowest on the 5th or 6th in the south of Luzon, Visayas, and Mindanao, and on the 9th in the center and north of Luzon. The mean temperature of the month was also less than that of last year. In Manila the difference from the normal was  $-1.0^{\circ}$  C., and from the mean of May, 1912, it was  $-1.6^{\circ}$  C.

### PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR MAY, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from May, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from May, 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		°C.	°C.	°C.		°C.	
Tagbilaran	758.23	-0.44	759.96	17	755.33	5	27.3	-0.2	33.7	4, 12	22.7	1
Surigao <sup>a</sup>	58.60	—	—	—	—	—	27.3	—	—	—	—	—
Cebu	58.19	-.39	59.81	17	54.56	5	28.3	-.6	33.5	16	23.9	6
Iloilo	57.91	-.60	59.54	17	54.79	6	27.6	-1.2	33.7	17	22.5	6
Ormoc	58.24	-.63	59.94	17	52.03	5	27.1	-.1	33.8	30	21.1	2
Tacloban	58.19	-.79	60.02	17	48.19	5	27.5 <sup>(b)</sup>	-1	32.6	18	—	—
Capiz	58.16	-.41	59.83	17	53.58	6	27.2	-1.5	35	8	22.8	6
Calbayog	58.09	-.79	59.86	18	50.11	5	26.7	-.8	35.5	31	22	2
Legaspi	58.35	-.53	59.99	18	55.26	6	28	-1.2	35	17	21.7	17
Atimonan	58.16	-.44	59.74	18	55.32	6	27.6	-1	34.1	14	22.6	17
Ambulong, Tanuan	57.82	—	59.36	17	55.03	6	27.7	—	36.5	18	21.9	22
Paracale	58.49	-.40	60.03	18	55.96	6	27.6	-.7	34.4	14	23	1
Manila	58.27	-.36	59.72	17	56.01	7	27.4	-1.6	35.4	18, 28	20	22
San Isidro	58.39	-.34	59.87	18	56.37	9	27.9	-1.4	36.5	4	21.4	22
Dagupan	57.62	-.47	59.20	17	54.87	9	28.2	-1.1	37.3	2	21.6	27
Bolinao	57.72	-.55	59.39	17	53.87	9	28.4	-1.4	35.5	5	23.1	9
Baguio <sup>c</sup>	636.33	-.56	637.71	17	632.87	9	18.6	-.7	26	17, 31	15	27
Vigan	757.78	-.66	759.48	18	751.61	9	28.2	-1.2	35.2	4	22.6	6, 9
Tuguegarao	58.19	-.28	60.08	18	54.17	9	28.3	-1.1	38.5	1, 2	22	4
Aparri	58.03	-.38	59.92	3	53.10	9	27.5	-.5	34.1	29	21.8	5

<sup>a</sup> 20 days of observation only.

<sup>b</sup> 30 days of observation only.

<sup>c</sup> The barometric readings of this station are not reduced to sea level.

Rainfall.—In eight stations only was there less rain than during May of last year, and yet, comparing the totals of all the stations with the normal rainfall for May, we find that the number of positive differences is equal to the negative differences. It must be remembered that the month of May, 1912, was a relatively dry one.

In Manila the amount of rain collected in the gauges was 40.5 mm., which is greater than that of last year by 19.6 mm., but less than the May normal by 68.7 mm.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF MAY, 1913.

Station.	Total.	Departure from May, 1912.	Departure from normal.	Rainy days.	Departure from May, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from May, 1912.	Departure from normal.	Rainy days.	Departure from May, 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.			mm.			mm.	mm.	mm.			mm.	
Jolo	184.3		+ 1.4	18		42.9	19	Calapan	277.7	+203.8		18	13	154.9	6
Isabela, Basilan	114.6	+ 52.5		15	+ 4	42.9	23	Virac <sup>b</sup>	215.6	+199?				126.5	5
Zamboanga	74.8	+ 14.3		11	+ 8	26.7	28	Nueva Caceres	71.2	- 52.5	- 24.1	11	+ 3	22.8	27
Davao	137.7	- 19.2	- 96.7	14	+ 5	30	2	Batangas	115	+100.8		8	+ 3	44.5	6
Cotabato	213.8	- 73.2	- 4.7	14	- 6	47.5	27	Atimonan	133.5	+ 76.3	- 25.7	16	+10	34.3	17
Cagayan, Misamis	142.4	+125.1		10	+ 5	36.3	14	Ambulong, Tanauan	184.6			7		108	26
Butuan	238.9	+218.4	+112.4	25	+21	53.1	6	Silang	161.9	+ 58.3		7	- 1	57.4	7
Dumaguete	75	+ 63.3		13	+13	16	6	Paracale	135.7	+ 87.7		17	+10	28.7	22
Yap, W. Carolines	106.9	-122.1		26	+ 9	21.1	1	Sta. Cruz, Laguna	45.5	- 91		11	- 2	19.5	6
Tagbilaran	15.6	+ 14.1	- 91.1	3	+ 2	9.9	30	Manila	40.5	+ 19.6	- 68.7	9	+ 4	9.8	8
Surigao <sup>a</sup>	144.9							Antipolo	39.2	-122.1		10	+ 3	9.2	9
Maasin	200.1	+200.1	+106.4	7	+ 7	65.8	5	Iba	227.8	+158		15	+ 8	74.3	9
Cebu	83.6	+ 51.1	- 8.4	13	+10	26.4	18	San Isidro	84.9	- 56.6	-109.3	10	- 3	16.8	16
Iloilo	156.5	+144.3	+ .3	14	+10	78.4	6	Tarlac	152.3	+ 38	- 37.7	11	- 2	33.3	27
San Jose Buenavista	136.4	+108.9		16	+11	36.3	6	Baler	290.1	+ 47.2		22	+ 4	60.5	6
Cuyo	252	+145.5		17	+10	49.3	5	Dagupan <sup>c</sup>	329.3	-129.8	+ 45.7	14	- 4	80.5	27
Guiuan	451.4	+434.7		15	+ 7	123.5	4	Bolinao	242.8	+224.2	- 67.9	12	5	121.8	9
Ormoc	86.6	+ 81.7	+ 13.8	10	+ 6	58.7	5	Baguio	354.4	-121	- 92.7	21	- 2	86.9	9
Tacloban	343.5	+326.4		19	+11	143.4	5	San Fernando, Union <sup>c</sup>	111.5	+109.4?	-67.2?			80.5	9
Capiz	183	+148.4	- 4	17	+14	49.5	6	Echague	60.6	- 95		10	- 3	15	20
Borongan	617.1	+584.2	+376.9	21	+ 9	240.5	5	Candon	370.6	+365.5		9	+ 8	231.7	9
Calbayog	207	+183.7	+ 40.4	17	-10	94.3	5	Vigan	363.1	+362.6	+233.3	12	-11	237.7	9
Masbate	84.3	+ 83.3		6	+ 5	73.7	5	Tuguegarao	114.5	- 35.1	- 4.3	8	- 2	23.4	9
Bagat	346			14		133.9	5	Laog <sup>d</sup>	53.8						
Gubat	239.7	+229.3		11	+ 9	60.7	2	Aparri	175.2	+128.6	+ 59.3	8	- 1	131.4	9
Legaspi	314.6	+282.6	+181.8	16	+10	97.7	5	Sto. Domingo, Bata-	162.1	+ 53.4		13	- 3	51.3	16
Sumay, Guam	38.9	+ 22.3		13	+ 8	13.4	27	nes							

<sup>a</sup> 20 days of observation only.<sup>b</sup> 28 days of observation.<sup>c</sup> 29 days of observation.<sup>d</sup> Rainfall for the 9th and 10th is not included, as the rain gauge could not be observed.

## DEPRESSIONS AND TYPHOONS.

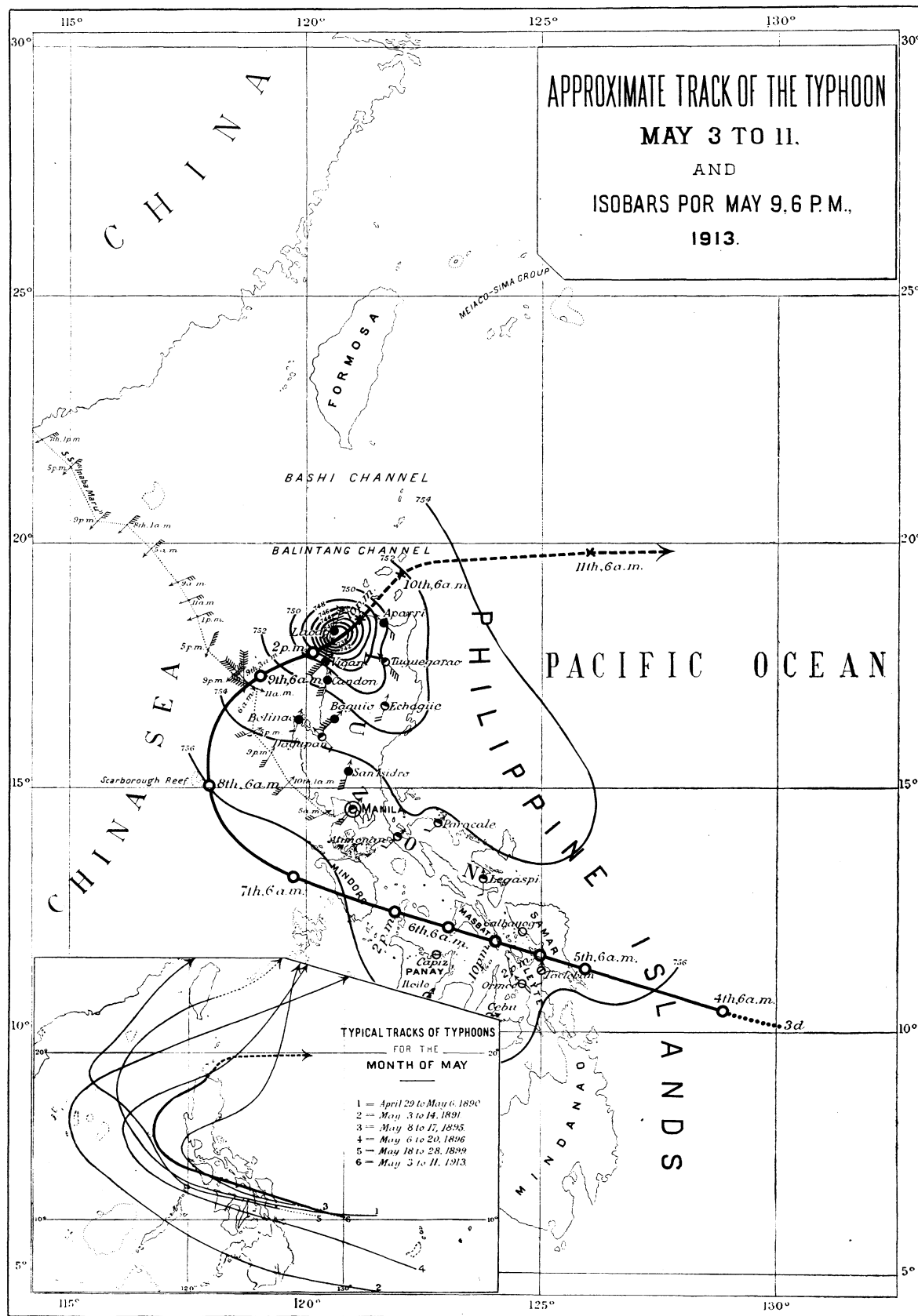
Leaving aside the depressions or areas of low pressure that had little or no importance for the Philippines, we propose to discuss at length the typhoon that raged in the Philippines and neighboring seas from the 4th to the 10th of the month.

## THE SAMAR AND ILOCOS TYPHOON, MAY 3-11, 1913.

Track of this typhoon typical for May.—The track followed by this typhoon has once again confirmed the proposition which we have held as very probable for a long time after many years of experience of Philippine typhoons. The proposition may be formulated in these terms: "Whenever, during the month of May, a typhoon crosses the Philippines by Mindanao or the Visayan Islands—that is, between parallels 6 and 13—and moves to the W or WNW, it may be held as very probable that it will recurve in the China Sea before reaching the Continent; and further, if the recurve takes place before the vortex has reached meridian 115° E of Greenwich, it is to be feared that the typhoon will cross the Archipelago a second time through the north of Luzon in the second branch of its parabolic track."

The importance of this proposition is easily evident, especially for the captains of ships navigating the China Sea and the interisland seas of the Philippines. Thus, for example, if a captain had left Manila for Hongkong or Formosa or the north of Luzon on May 7 of this year when the typhoon was in the China Sea to the W of Luzon, it is clear that he might very well have been caught by the storm in its movement of translation toward the NE after its recurve; and his danger would be the greater, the greater his conviction that the typhoon was moving away from the Philippines toward the Continent.

In Plate I the track of the present typhoon is plotted, together with five others of the same type that have been studied by the Observatory since 1890. Two of them recurved before reaching 115° E and crossed the Archipelago a second time by the



NB - The barometric readings have been reduced to standard gravity

north of Luzon, as happened also this year. The other three recurved farther away and the second branch of the parabola was directed to Formosa or to the neighborhood of that island. All these typhoons occurred in the month of May. To this may be added (1) that there are very few cases of similar tracks in other months of the year and (2) that we can hardly remember any case of a typhoon that, having crossed Mindanao or the Visayas in the direction W or WNW during the month of May, continued in more or less the same direction, without recurving, till it reached the Continent.

**Origin of the typhoon.**—This typhoon, like the one in Cebu last year, belongs to the type of those that form close to the Philippines and without exercising any influence on the Western Carolines. Neither the observations made in the Carolines nor even those in the Pelew gave any indication that might be taken as a certain or even as a probable sign of the typhoon. Hence in Plate I, it has been supposed that it formed on May 3 close to  $130^{\circ}$  or  $131^{\circ}$  E Greenwich and parallel  $10^{\circ}$  N.

**The typhoon in Samar and Leyte.**—There is not the slightest doubt that these typhoons which form so close to the Philippines are to be the most feared in that they allow little time to give the proper warnings to the more easterly islands and stations of the Archipelago. And hence we cannot sufficiently commend the vigilance and promptitude of the observer of Borongan, Rev. Fr. Cesareo Montes, O. F. M., who at daybreak of the 4th announced that a dangerous typhoon was approaching Samar. We give in his own words the motives that induced him to warn the people and authorities of that town.

The typhoon that crossed this Island of Samar appears to belong to the type of those that form close or very close to the Philippines. No certain sign of a typhoon could be noted before the 3d. At 7 p. m. of that day the first sure sign of a typhoon was observed, viz, a rough sea from the SE, which continued without interruption during the night. In the early morning of the 4th it was seen quite *clearly* that there was a well-developed typhoon to the SE, for the cumulo-nimbus were scudding across the sky from the north with great velocity, and the sea was constantly on the increase always from the SE, which are infallible signs of a dangerous typhoon. The public and the authorities were therefore warned by means of the following note: "There is a typhoon in the Pacific to the SE. Prepare as usual, for it is dangerous for Samar."

What happened in Borongan on the morning of the following day fully justified the preventative warning sent out by Father Montes. His report is so interesting, as to the intensity with which the typhoon broke on the part of the coast of Samar where the vortex entered the Island, that we give his words.

On the early morning of the 5th seeing that there was a decided and rapid fall of the barometer and that the sea was very heavy, I had the following warning sent to the public by means of a crier: "The typhoon is approaching Borongan by the S, and the danger is imminent."

The strongest and most destructive winds were from the NE, ENE, E, and ESE. At 9 a. m. the hurricane winds began to blow down houses, unroof buildings, and tear up coconut palms, nor did they spare those houses and buildings respected by previous storms. An absolute vortical calm was not observed, but the winds continued veering, though with less force (8 to 9 of the Beaufort scale). At 10.40 a. m. the barometric minimum was registered and at the same time there was the sky covered by a thin veil of cloud, which is usually observed near the vortex. The vortex itself must have passed over Hernani and Llorente, for, according to reports received from those towns, there was complete calm for half an hour between 9 and 10 a. m., the wind then jumping round to ESE. This coincides perfectly with the transparency of the sky observed at 10.40 a. m. in Borongan. The strongest winds in Hernani and Llorente (Lanang) were those from NE, ENE, and ESE. In Pambujan the winds were from the NW since the afternoon of the 4th, after which they backed to W and SW.

As to the rising of the sea, the *cyclonic wave*, which in extraordinary cases has been felt on this coast in other typhoons, was not observed in the present case. Nevertheless the *hurricane swell* was so great that it rose well up into the rivers, so that where it met the strong current of the river caused by the heavy rains a high crest was formed.

There were no fatalities in the town, but the material losses are incalculable, for besides the houses destroyed and buildings unroofed, all the plantations were razed to the ground.

In order that some idea may be formed of the intensity and shape of this typhoon while crossing the Island of Samar, we give in a table below the observations made in

Guiuan, Borongan, and Tacloban on May 4 and 5; and in Plate II the isobars corresponding to 2 p. m. of the 5th when the vortex was between Catbalogan and Tacloban and close to the south of Maqueda Bay. In the same Plate II are also included the barometric curves of Guiuan, Borongan, Tacloban, Catbalogan, and Calbayog.<sup>1</sup>

## METEOROLOGICAL OBSERVATIONS FOR MAY 4 AND 5, 1913.

Date and hour.	Guiuan.				Borongan.				Tacloban.			
	Pres-sure.	Wind.		Rain-fall.	Pres-sure.	Wind.		Rain-fall.	Pres-sure.	Wind.		Rain-fall. <sup>a</sup>
		Direc-tion.	Force.			Direc-tion.	Force.			Direc-tion.	Force.	
May 4:	mm.		0-12	mm.	mm.		0-12	mm.	mm.		0-12	mm.
6 a. m.	755.67	N	1	o	756.51	Calm			756.77	NW	3	o, q
10 a. m.	55.23	N	1	o, r					57.21	NNW	3	o, q, r
2 p. m.	54.02	N	2	o, r	55.61	N	3	o, q, r	55.43	NE	4	o, q, r, t
6 p. m.	53.52	N	3	o, r					55.42	NW	2	o
10 p. m.	53.69	N	4	o, q, r					56.08	WNW	3	o, q, r
Midnight	53.09	NbyW	4	o, q, r					54.87	NW	5	o, q, r
May 5:												
1 a. m.	52.07	NbyW	4	o, q, r					53.99	NW	4	o, q, r
2 a. m.	51.88	NNW	5	o, q, r	42.7				53.18	NW	3	o, q, r
3 a. m.	48.39	NNW	6	o, q, r					52.05	NW	4	o, q, r
4 a. m.	47.07	NNW	6	o, q, r					51.76	WNW	7	o, q, r
5 a. m.	45.11	NWbyN	7-8	o, q, r					51.71	WNW	5	o, q, r
6 a. m.	41.64	NW	10	o, q, r	48.8	NW-N	6	o, q, r	50.84	WNW	7	o, q, r
7 a. m.	39.20	WbyN	12	o, q, r	46.27	NW	8-10	o, q, r	49.91	WNW	5	o, q, r
7.30 a. m.	38.07	WNW	12	o, q, r	45.17	NW	8	o, q, r	49.82	WNW	8	o, q, r
8 a. m.	36.45	WbyN	12	o, q, r	43.19	N	10	o, q	49.65	WNW	6	o, q, r
8.30 a. m.	36.47	W	12	o, q, r	41.30	NbyE	10	o, q, r	48.65	WNW	9	o, q, r
9 a. m.	37.33	w-WSW	12	o, q, r	36.04	NNE	11	o, q, r	47.81	WNW	10	o, q, r
9.30 a. m.	38.48	WSW	12	o, q, r	33.63	NNE-NE	12	o, q, r	46.08	WbyN	10	o, q, r
10 a. m.	40.99	SW	12	o, q, r	30.18	ENE-E	12	o, q, r	45.08	WNW	11	o, q, r
10.30 a. m.	43.64	SW	12	o, q, r	29.35	E-ESE	12	o, q, r	41.09	WbyN	9	o, q, r
10.40 a. m.					27.75	E-ESE	12	o, q, r				
11 a. m.					28.60	ESE	12	o, q, r	39.33	W	11	o, q, r
11.30 a. m.					31.13	ESE	12	o, q, r	38.73	W	11	o, q, r
Noon	47.62	SW	11	o, q, r	35.86	ESE	12	o, q, r	37.27	W	12	o, q, r
12.30 p. m.	48.22	SWbyS	11	o, q, r					35.49	WSW	12	o, q, r
1 p. m.					39.06	ESE	12	o, q, r	35.19	WSW	12	o, q, r
1.30 p. m.									36.65	WSW	11	o, q, r
2 p. m.	49.82	SSW	10	o, q, r	45.69	ESE	12	o, q, r	38.13	SW	12	o, q, r
3 p. m.					46.94	ESE	12	o, q, r	40.70	SSW	6	o, q, r
4 p. m.					47.64	SE	11	o, q	43.79	SW	8	o, q, r
5 p. m.									46.70	S	5	o, q, r
6 p. m.									48.55	SSE	5	o, q, r
8 p. m.									51.51	SSE	4	o, q, r
10 p. m.									53.37	SSE	5	o, q, r

<sup>a</sup> Observations made every four hours.

<sup>b</sup> Rainfall from 2 p. m. of the 3d to 6 a. m. of the 4th.

<sup>c</sup> Rainfall from 2 p. m. of the 3d to 6 a. m. of the 4th.

<sup>d</sup> From 2 p. m. of the 4th to 6 a. m. of the 5th, the rainfall observations are made every 4 hours.

<sup>e</sup> Rainfall from 6 a. m. to 2 p. m.

<sup>f</sup> Rainfall from 6 a. m. of the 5th to 6 a. m. of the 6th.

The observer at Tacloban, capital of the Island of Leyte, describes the effects of the storm in that town thus:

Ten per cent of the houses were blown over. Of the rest, the great majority were unroofed and the others were blown out of the perpendicular and were inclined to the east. A few small boats were lost, all the fish corrals were destroyed, the piers were damaged in part, the Scouts' barracks and the other buildings of strong materials were partly unroofed, and the temporary church was blown down.

The typhoon in the Interisland Seas.—After the typhoon had crossed the southern part of Samar very slowly in the direction W by N during the morning of the 5th, it continued its course with the same speed and direction across the seas between Luzon and the Visayas, till it entered the China Sea on the morning of the 7th, after having crossed the southern part of Mindoro. It also appears certain that the vortex just touched the Island of Masbate by the south and passed over the center of Tablas. See

<sup>1</sup> The discussion of this typhoon was ready for the printer when certified copies of the telegrams and reports sent by the presidents of the different towns concerning the effects of the storm were received from the honorable governor of Samar, D. Vicente Jazmines. As it is impossible to reproduce here the statistics thus received, we give the conclusions derived from these reports. First, the destructive effects of the typhoons were felt throughout the whole of the southern half of the Island of Samar, and secondly the effects were greater in the towns on the eastern coast than in those of the western, which goes to show that the storm had lost something of its intensity in crossing that island.

# BAROGRAPHIC RECORDS AND ISOBARS TYPHOON OF MAY 3 TO 11, 1913.

Plate II

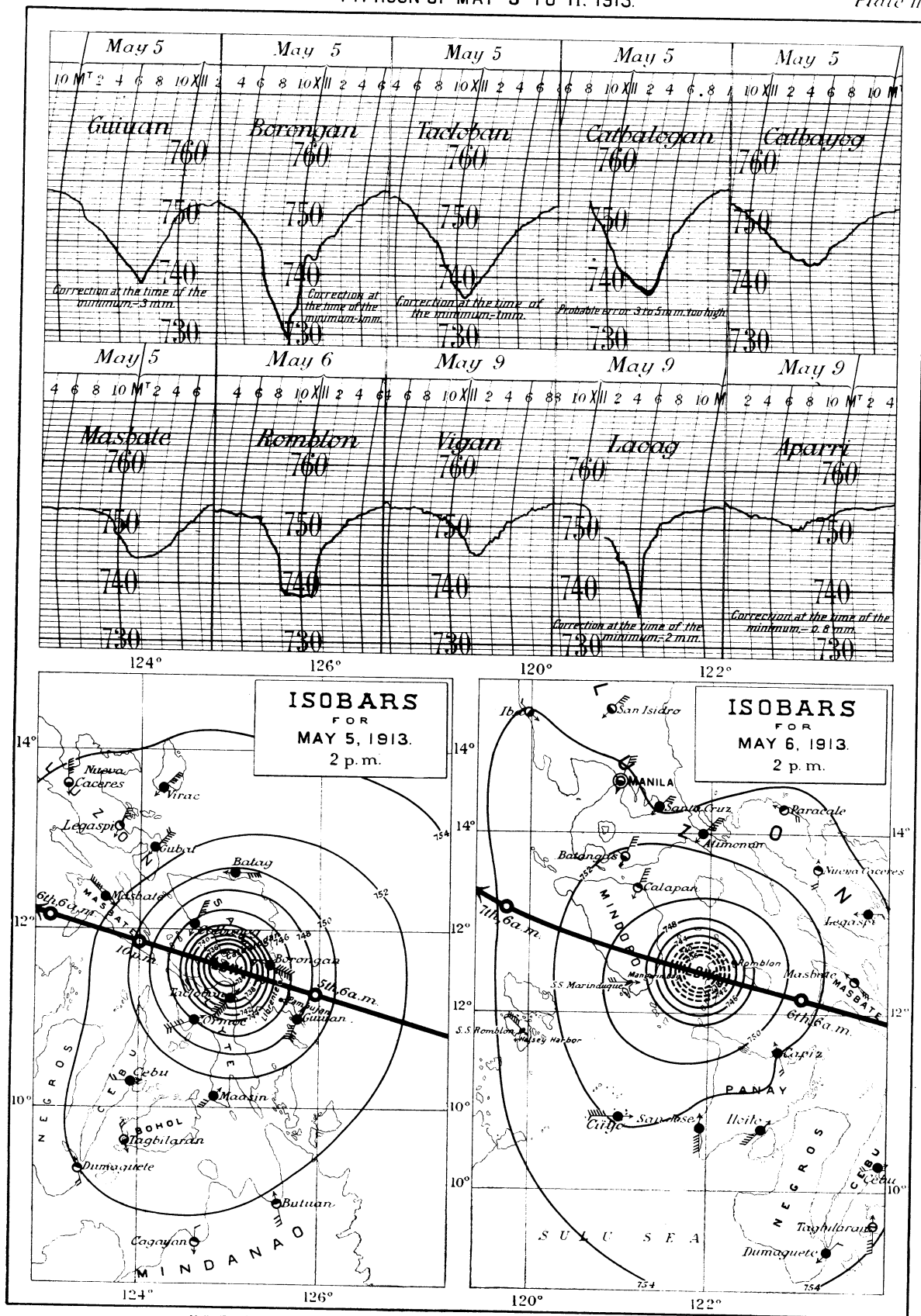


Plate II, where are traced the isobars for 2 p. m. of the 6th, and the track from 10 p. m. of the 5th to 6 a. m. of the 7th.

The barometric minimum at Romblon was 738 mm. and lasted for an hour commencing at 11 a. m. of the 6th, during which time the relative calm was observed. At 12 o'clock noon hurricane winds from ESE began which continued for three hours. If we compare the observations of Romblon with those of Borongan, Guiuan, and Tacloban, it will be seen that the vortex had lost something of its strength and depth when it passed at its minimum distance from Romblon. Later on the vortex deepened and strengthened again when it reached the China Sea.

It was said above that the typhoon traveled slowly while crossing the interisland seas to the south of Luzon, and this is seen from the fact that from 2 p. m. of the 5th till 2 p. m. of the 6th, it only traveled about 180 nautical miles, i. e., with a velocity of only 7.5 miles per hour.

Recurve of the typhoon in the China Sea.—Notwithstanding the slowness with which the typhoon moved on the 5th and 6th, nevertheless its movement of translation decreased still further in velocity while in the China Sea at the same time that it made a complete recurve to the W of Luzon during the 7th and 8th. The observations made on several steamers which were in or near the vortex have helped us greatly in tracing this part of the track. Especially must we thank the captains of the steamships *Salahadji*, *Taming*, and *Inaba Maru* for their courtesy in placing their observations at our disposal. The course followed by the *Inaba Maru* from Hongkong to Manila, together with the direction and force of the winds encountered, is given in Plate I. The barometric minimum on board the *Inaba Maru* was 731.66 mm. and was observed at 3 a. m. of the 9th. The observations made on board the *Taming* and the *Salahadji* are so very interesting that it has been thought advisable to give them in full.

METEOROLOGICAL OBSERVATIONS MADE ON BOARD THE STEAMER "SALAHADJI" (CAPT. F. DE HAAN),  
MAY 6 TO 9, 1913.

Date and hours.	Wind.			Remarks.	Date and hours.	Wind.			Remarks.
	Pres- sure.	Direc- tion.	Force.			Pres- sure.	Direc- tion.	Force.	
May 6:	mm.		0-12		May 8:	mm.		0-12	
Midnight	755	NNE	3		6 a. m.	721	S	12	
May 7:					7 a. m.	20	S	12	
4 a. m.	52.2	NE	3-5	Cloudy weather.	8 a. m.	20	S	12	Ship heading to NW be- tween 4 a. m. and 8 a. m.
5 a. m.	51.2	NE	6		9 a. m.	20	S	12	
6 a. m.	50	NE	8		10 a. m.	19	S	12	
7 a. m.	49.8	NE	9	At 6.30 a. m. ship was about 15 miles from Cabra Is- land and going north.	11 a. m.	18	S	12	
8 a. m.	50.5	NEbyE	10		Noon	17	S	12	Heading to NW between 8 a. m. and noon. Try to go SE, but prevented engine to go half speed; stern going probably to SSE opposite to waves and winds. Barome- ter rising.
9 a. m.	50.5	ENE	10	Heavy rain.	2 p. m.	27	S	12	The funnel blows away and had to stop the en- gine and shoot the fires out with the result that the compass was broken.
10 a. m.	50.8	E	10		7 p. m.	10			Could not estimate the di- rection of the wind.
11 a. m.	51	EbyS	10		7.30 p. m.	9	Calm		Little blue sky and could see the stars. Barom- eter oscillating 709-714 during whole night until 6 a. m. of the 9th.
Noon	51	EbyS	11	High sea from NE to E. Ship's position was 14° 33' lat. N., and 119° 40' long. E.	May 9:				
1 p. m.	50	EbyS	10		7 a. m.				Barometer goes up very quick.
2 p. m.	49	ESE	10	Try to go north, but pre- vented by sea and wind.	Noon	37			Position unknown. Ship head was N with a NE resultant.
3 p. m.	48	EbyS	10		4.30 p. m.	49			
4 p. m.	46.3	E	11	Heavy rain. High wild sea. Could not steer the ship any more.	7 p. m.	51.5			Ship's position on 10th at noon 17° 24' lat. N, 120° long. E.
5 p. m.	45.5	E	12	Do.					
6 p. m.	44	E	12	Do.					
7 p. m.	43	E	12	Do.					
8 p. m.	42.5	E	12	Ship heading to WSW.					
9 p. m.	39	E	12						
10 p. m.	37	EbyS	12						
11 p. m.	35	SE	12						
Midnight	32	SE	12						
May 8:									
1 a. m.	30	SSE	12						
2 a. m.	31	SbyE	12						
3 a. m.	28	S	11						
4 a. m.	28	SSW	11	Ship heading to W be- tween mn. and 4 a. m.					
5 a. m.	26	SSW	12						

METEOROLOGICAL OBSERVATIONS MADE ON BOARD THE STEAMER "TAMING" (CAPT. G. H. PENNEFATHER),  
MAY 8 AND 9, 1913.

Date and hour.	Position.		Pres- sure.	Wind.		Remarks.
	Lati- tude north.	Longi- tude east.		Direc- tion.	Force.	
May 8:	°	'	mm.		0-12	
4 a. m.			755.13	NE	4	At 6.30 a. m. winds shifted to ESE.
8 a. m.			55.64	ESE	4	
Noon	16 52	118 22	54.62	EbyS	7	High sea from SE; tried to heave vessel to but she fell into trough of sea and lay there with engines going as fast as consistent with safety and helm hard over heading southerly.
1 p. m.			53.60	EbyS	7	
2 p. m.			52.59	EbyS	7	Some rain squalls.
3 p. m.			50.56	EbyS	8	Frequent fierce squalls of wind and rain.
4 p. m.			49.29	EbyS	8	Frequent fierce squalls of wind and rain; confused sea.
5 p. m.			48.78	EbyS	8	Do.
6 p. m.			48.52	EbyS	8	Do.
7 p. m.			47.76	EbyS	9	Heavy gale, fierce squalls, high confused sea, spoon-drift flying over vessel.
8 p. m.			46.49	EbyS	9	
9 p. m.			42.94	EbyS	9	Whole gale, rain spoon-drift, lightning.
10 p. m.			34.30	E	10	Heavy gale, incessant rain, spoon-drift, vessel shipping water and wind blowing fittings overboard.
11 p. m.			13.98	E	12	Glass dropped 0.80 inch (20.3 mm.) in the last hour, wind blowing full typhoon force, unable to face it or stand on deck 11.05 p. m. entered the central calm; light southerly wind, sea comparatively smooth, incessant lightning just before entering calm heard one loud peal of thunder.
12 midnight			12.71			
May 9:						
1 a. m.			13.73	SW	12	0.30 a. m. wind came out from SW with hurricane force, heavy blinding rain, lightning and high SW sea; vessel lying in trough.
2 a. m.			15.25	SW	12	Similar conditions; wind and sea.
3 a. m.			16.78	SW		Do.
4 a. m.			17.54	SW		Do.
5 a. m.			17.54	SSW	11	Do.
6 a. m.			14.74	SSW		Do.
7 a. m.			14.24			Do.
7.30 a. m.			12.46	SbyE	5	Entered central calm; sea boiling, coming from all directions but not high. A quantity of land birds aboard, weather looking much brighter.
8 a. m.			15	Sly	5	
9 a. m.			18.81	NW	12	Glass rising rapidly.
10 a. m.			26.43	NW	10	Wind and sea decreasing.
11 a. m.			41.16	NW	8	Squalls less frequent.
Noon	Supposed noon position. 16 24 118 40 Actual latitude worked back from Piedra point which place was abeam at 6.50 p. m., 17 11 119 56		45.73	NW	7	Vessel able to head her course S 14° E true.
1 p. m.			49.79	W	6	
2 p. m.			51.06	WSW	6	
3 p. m.			52.33	WSW	5	
4 p. m.			53.10	WSW	5	
8 p. m.	6.50 p. m. Pie- dra Pt. ab.		55.64	WSW	4	
12 midnight	10.30 p. m. H ermana Mayor.		56.40	SSW		

The experience of the steamship *Salahadji* in remaining for the space of seventeen hours close to the vortex and in being carried by the force of the storm from Isla Cabra to the vicinity of Vigan is probably unique in the history of the typhoons of the Far East. The following account of this experience was prepared by Father Brown of the Observatory and published in the Manila Times of May 20:

The steamship *Salahadji*, Capt. F. de Haan, was caught by the typhoon close to the Isla Cabra and carried along by the vortex of the typhoon as far as Vigan. The log book of the vessel has been examined and it appears that she was actually in the vortex of the storm for seventeen hours and experienced hurricane winds for thirty-one hours. The experience undergone by the vessel is so interesting and probably so unique in the whole history of typhoons of the Far East that we set down here a brief résumé of what happened.

The Petroleum Asiatic Company's steamer *Salahadji* was at 6.30 a. m. of May 7 some 15 miles from Isla Cabra, one of the Lubang Islands to the north of Mindoro. The typhoon was then passing by the south in the direction WNW at a distance from the vessel of about 50 miles. The barometer on



board had been falling since midnight with winds from the NE, increasing every minute, as the vessel approached the typhoon in the direction S 28° E. At 7 a. m. the barometer marked 750 mm. and the wind had reached force 9 of the Beaufort scale. As the rain at the time was such as to shut in completely the horizon, the captain was afraid of running foul of one of the islands of the Lubang group and so determined to make north. When this had been done the barometer rose slightly and the wind veered to the E with the same force as before, as the vortex moved to the WNW. At midday of the 7th, the position of the vessel was 14° 33' lat. N and 119° 40' long. E; i. e., about 80 miles to the W of Manila. The captain determined to make SSW, but the E by S wind which had increased to force 10 drove him to the SW. This brought the ship nearer to the vortex, which was to her SW, and the barometer fell more and more till at 2 p. m. it stood at 749 mm. with winds of force 10 from the ESE. In order to escape the vortex, the captain endeavored to steer N, but this was impossible for the strength of the winds and the swell drove him to the W, i. e., to where the vortex was to pass.

At 4 p. m. the barometer read 746 mm. with hurricane winds of force 11 from the E, so that the vortex was to the SW at a distance of about 35 miles. From 4 p. m. the helm was held hard over to the WSW, but the squalls were so continuous and strong, with a wild high sea, that the ship would no longer answer. At 6 p. m. with the barometer at 744 mm. she entered the violent zone of the typhoon with hurricane winds of force 12 from the E and then for five full hours she continued in the same relative position with regard to the vortex, tossed about by the violent winds and furious sea.

At midnight the barometer was at 732 mm. with hurricane winds from the SE. The captain tried and tried again to maintain his course to the WSW, but the winds which backed from S to E and the swell from the SW were so terrific that the resultant course of the ship was, respectively, W, WNW, NW, and N, so that she could not break out of the awful ring which held her a prisoner.

At 5 a. m. of the 8th the wind was blowing from the SSW, and at 6 a. m. from the S with force 12, and this continued till 2 p. m. of the same day, the barometer at midday standing at 717 mm. As a last effort to break through the ring that held him, the captain changed his course to SE at half speed against the direction of the swell and wind. With tremendous difficulty he managed to navigate for two hours to the SSE so that from midday to 2 p. m. the barometer rose 10 mm. The wind, however, did not abate its force; on the contrary, there were gusts of extraordinary violence, one of which carried away the funnel, extinguished the fires, and broke the compass and top fittings so that the vessel was left entirely at the mercy of the storm, and was drawn in by the winds and carried by the vortex along the path of the typhoon till about 7 a. m. of the 9th, i. e., for a space of seventeen hours. During the whole of this time the barometer oscillated between 709 and 714 mm. At 7.30 p. m. of the 8th the ship entered the vortical calm—the sky cleared a little in the zenith so that a few stars could be seen, the sea was relatively calm with a strong ground swell that broke in all directions, but without any violent waves—and the barometer reached the minimum of 709 mm. It was at this point that the captain put out four deep-sea anchors held by 60-fathom chain cables in order to prevent the ship being carried along by the wind and the waves when the vortex moved forward along its track. The anchors held and he thus succeeded little by little in clearing the vortex, so that by midday of the 9th the barometer had risen to 737 mm.

As the compass had been put out of commission several hours previously, it was impossible to calculate his position or the direction of the winds and sea, so that when the vortex had gone on ahead and the weather began to improve, the ship was left in an unknown position. The barometer rose rapidly in such sort that by 4.30 p. m. of the 9th it was at 749 mm., and at 7 p. m. at 751.5 mm. At nightfall of the same day the weather was relatively good and at daybreak of the 10th another steamer was seen in the offing from which the captain learned his position, viz, 120° long. E and 17° 24' lat. N. or some 25 miles from Vigan, Ilocos Norte. The steamer met with was the *Fumi Maru* of the same company, and she towed the *Salahadji* to Manila.

In the same number of the Manila Times, Father Algué, Director of the Observatory, published a short article on the track and intensity of the typhoon from which we copy the following, which refers to the experience of the steamship *Taming* during the same storm.

The rapidity of the fall of the barometer was so great in the China Sea that on board the *Taming* there was a fall of 20 mm. in one hour before she entered the vortex about midnight of the 8th. Since the gradient was so steep it is easy to understand the terrific fury of the winds experienced by the vessel, nor is it surprising that Capt. G. H. Pennefather, a seaman of great experience, had to confess that during the twenty years he had navigated the China Sea he had never been in such a violent storm. \* \* \* The *Taming* was in the vortex twice, once at midnight of the 8th, and again at 7 a. m. of the 9th, when the minimum, 712 mm., was observed.

The typhoon in Ilocos.—On the 8th the Observatory announced the recurve of the typhoon and ordered the proper signals to be hoisted in the stations of the Provinces of Ilocos and Cagayan, in order to warn the people of the danger that threatened them. In the track of this typhoon (Plate I) it may be seen that the typhoon actually crossed the northwest of Luzon in its movement of translation to the ENE and NE. The vortex entered the island at the dividing line of the Provinces of Ilocos Norte and Sur, as the towns in the south of Ilocos Norte and in the north of Ilocos Sur were the most to suffer from the destructive effects of the storm.

The observer in Vigan and other eyewitnesses all affirm that this was one of the severest and most destructive typhoons experienced in that district. The observer in Laoag in one of his reports on the storm says that "the towns situated in the southern part of the province, v. g., San Miguel, Dingras, Batac, Paoay, Currimaio, and Badoc, suffered greatly from the violence of the typhoon, and that practically all the houses in the three last mentioned towns were blown down." The same may be said of the two towns Sinait and Cabugao, situated in the most northerly part of the coast of Ilocos Sur, as we learn from another report of the observer of Vigan and from private letters.

Rev. José Clotet, S. J., professor in the College of the Immaculate Conception, Vigan, sent the following letter to the Director of the Observatory:

The wind squalls from the south were so strong that I do not remember ever to have experienced such in my life. \* \* \* Many in Vigan say that the storm was the greatest that has been felt here for many years. \* \* \* I have just been speaking with the Spaniard, Don Salvador Rivero, and he tells me terrible things of the damage in Sinait and Badoc which he has just visited. Between Sinait and Badoc some of the iron telegraph posts were bent double, while others were twisted three or four times round; the banana plants were not blown down, but the tops were cut off as if they had been cut with a bolo, leaving about a meter and a half of the stem in the ground. In Badoc there were 13 houses of strong material—stone and wood with zinc roofs—but not one was left intact. There have been fatalities in all the towns mentioned. In Batac a flying plank killed the presidente and his daughter as they were running to a more secure refuge. The typhoon was very destructive, and presidencias and other strong buildings have been left in ruins.

A viray which left Santo Domingo for Cabugao with 17 persons on board is reported lost with all hands.

From another letter sent from Paoay to Rev. José Alfonso, S. J., rector of the College in Vigan, we take the following:

The violence of the typhoon that passed over our town was truly awful. More than 3,000 houses in this town were destroyed and thus thousands of men, women, and children are without homes and were forced to sleep under trees and temporary shelters they were able to raise.

According to the statistics obtained by our observer of Laoag from the office of the provincial governor of Ilocos Norte we have the following effects of the typhoon in the province:

Dead .....	20
Seriously injured .....	30
Houses totally destroyed .....	22,076
Houses unroofed .....	2,998

In these statistics the number of presidencias, churches, markets, and public schools which were also destroyed are not included.

The total loss to the province amounts to ₱1,832,918.<sup>1</sup>

With regard to Ilocos Sur the following details are taken from a telegram sent by the provincial governor to the Executive Secretary:

In the towns to the south of Vigan, from Santa Cruz to Santa the losses have been insignificant.

In the other towns to the north from Caoayan and Vigan to Sinait the damage was very great and the material losses are reckoned at ₱489,778.

<sup>1</sup> We are not sure whether this sum includes the damage done to the public buildings mentioned in the preceding paragraph.

The telegram continues giving a few details of each of the towns in the regions mentioned, but here we will content ourselves by copying what was said of the towns Cabugao and Sinait:

*Cabugao*.—Three hundred and thirty-six houses of strong and mixed materials were completely destroyed. The zinc roofs of the presidencia, the convent, church, and other buildings were torn off. The rest of the houses of the town suffered greatly, though they were not totally destroyed. One person was killed and five wounded, three of them seriously. The material loss was ₱30,000.

*Sinait*.—Of the 421 houses in the town, 341 of strong, mixed, and light materials were completely destroyed, and even stone walls were razed to the ground. Five persons were killed and five wounded. The material losses are reckoned at ₱418,740.

Account is also given in the same telegram of various losses at sea, the most notable of which were:

The banca *Federico*, owned by D. Pedro Fabre of Vigan, which was at anchor in Sulvec, the port of Narvacan, was dashed to pieces by the fury of the waves, the 11 persons on board being drowned.

The *Cesar*, loaded with sugar, the property of D. Gregorio Sy Quia, was wrecked just outside the port of Pandan and four of the crew were drowned.

The banca *Astronomia* was cast on the rocks near San Vicente and five passengers were drowned.

The parao *Santa Clara* on her trip from Dagupan was wrecked on the coast of Lapog, 17 of the crew and passengers being drowned.

Thanks to our observer in Vigan, we are enabled to reproduce here in Plates III, IV, and V photographs taken after the passage of the typhoon in the towns mentioned above. Some of these photographs were placed at our disposal by Mr. R. L. Somers, supervisor of the Singer Sewing Machine Company.

We give in the following table the observations made at Vigan, Laoag, and Aparri, and in Plate I reproduce the barographic records of the same stations together with the isobars for 6 p. m. of the 9th, when the vortex was in Luzon to the SE of Laoag.

METEOROLOGICAL OBSERVATIONS FOR MAY 8 TO 10, 1913.

Vigan.										Laoag.					Aparri.									
Date and hour.	Pres-sure.	Wind.		Wea-ther.	Rain-fall.	Pres-sure.	Wind.		Wea-ther.	Rain-fall.	Date and hour.	Pres-sure.	Wind.		Wea-ther.	Rain-fall. (a)								
		Direction.	Force.				Direction.	Force.					Direction.	Force.										
	mm.		Miles p. h.	0-12	mm.	mm.		0-12	mm.			mm.		Miles p. h.	0-12	mm.								
May 8:											May 9:													
6 p. m.	754.42	NE	9.6	2	o	755.33	Calm	0-12	o,d	13.0	Noon	754.36	S	10.8	2	o								
10 p. m.	55.14	NE	6	1	o	55.32	Calm			.4	2 p. m.	52.94	S	6	1	o, p								
May 9:											4 p. m.	51.75	SSE	6	1	o								
6 a. m.	53.05	NE	2.4	1	o, p	52.79	Calm		o		6 p. m.	50.93	SE	8.4	2	o, r								
8 a. m.	53.24	ESE	3	1	o, r	53.94	Calm		o, r	.4	7 p. m.	50.27	SSE	15.6	3	q, r								
10 a. m.	52.43	ESE	15.6	3	o, q, r	53.13	Calm		o, r	1.3	8 p. m.	49.63	SSE	25.2	5	q, r								
Noon	49.64	SE	33.5	6	o, q, r	52.48	Calm		o, r	3.6	9 p. m.	49.46	SSE	25.2	5	q, r								
1 p. m.	48.41	SE	34.8	7	o, q, r	50.52	NE	1	o, r	1.5	10 p. m.	51.14	S	31.2	6	q, r								
2 p. m.	44.90	SSE	51.6	9	o, q, r	49.05	ENE	1	o, r, t	1.3	11 p. m.	51.35	S	22.8	4	q, r								
3 p. m.	44.65	S	60	10	o, q, r	46.45	ESE	3	o, q, r	1.5	May 10:													
4 p. m.	47.18	SSW	48	8	o, q, r	42.37	E	6	q, r, t	6.4	2 a. m.	52.96	SW	7.2	1	o								
5 p. m.	49.43	SSW	39.6	7	o, q, r	37.56	ENE	10	o, q, r	(c)	6 a. m.	53.46	SSW	15.6	3	o, q								
5.30 p. m.						35.07	ENE	10	o, q, r		10 a. m.	55.51	NW	9.6	2	o								
5.45 p. m.						33	NNE	12	o, q, r															
6 p. m.	51.07	SW	32.4	6	o, q, r	35.6	NNE	6-7	o, q, r															
6.30 p. m.							N-NNE	3	o, q, r															
7 p. m.	52.97	SSW	34.8	7	o, q, r	14.7	NNW-NW	1																
8 p. m.	54.06	SW	21.5	4	o, q, r	7.9																		
10 p. m.	55.07	SSW	19.4	4	o, q, r	8.6																		

<sup>a</sup> Observations made every four hours. <sup>b</sup> Rainfall from 4 p. m. to 5.40 p. m. <sup>c</sup> The rain gauge was blown over by the typhoon.

According to these observations it is evident that the typhoon after the recurve traveled with greater velocity than when it crossed the Visayas or when it was in the China Sea. When crossing the north of Luzon, this velocity was about 8.7 miles per hour.

We have not sufficient data to enable us to plot with accuracy the further course of the storm after it had crossed the north of Luzon and the Babuyan Islands (see

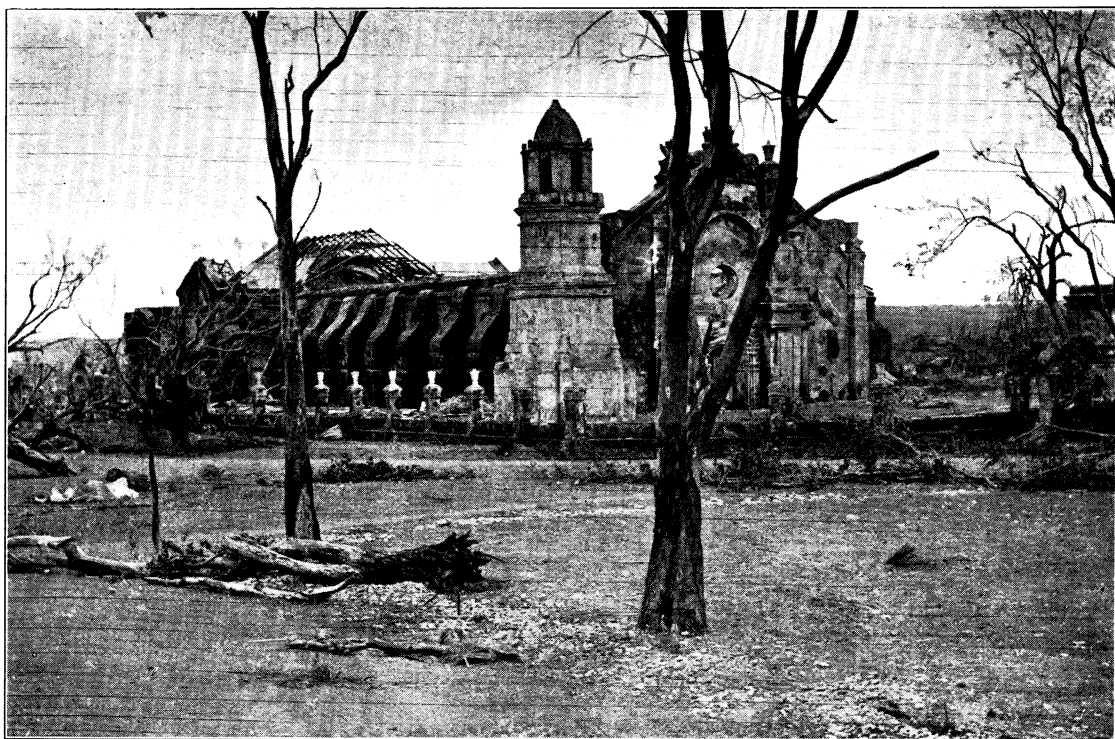
Plate I). Nevertheless judging from the observations made in Aparri and Santo Domingo, Batanes Islands, it seems very probable that it moved to the E on the 10th, and filled up on the 11th, somewhere near parallel  $20^{\circ}$  N and between meridians  $125^{\circ}$  and  $130^{\circ}$  E.

**Typhoon warnings of the Observatory.**—The following are the warnings sent by the Manila Observatory as usual to the Observatories of Tokio, Zikawei, Taihoku, Hongkong, and Phulien:

- May 4, 4.45 p. m.: Typhoon E of northern Mindanao, direction unknown.
- May 5, 8.40 a. m.: Typhoon E of the Visayan Islands, moving W or WNW.
- May 5, 5.45 p. m.: Typhoon over the Visayan Islands, moving W or WNW.
- May 6, 9.40 a. m.: Typhoon in about  $122^{\circ}$  long. E and  $12^{\circ}$  lat. N, moving WNW.
- May 7, 8.40 a. m.: Typhoon in about  $120^{\circ}$  long. E. and  $13^{\circ}$  lat. N, moving WNW.
- May 8, 9.25 a. m.: Typhoon near  $116^{\circ}$  long. E and  $15^{\circ}$  lat. N, inclining northward.
- May 9, 9.50 a. m.: Typhoon W of northern Luzon, more than 100 miles distant, moving NNE or NE.
- May 10, 7.45 a. m.: Typhoon N of Aparri, moving NE.



The Singer store, Sinait, Ilocos Sur.



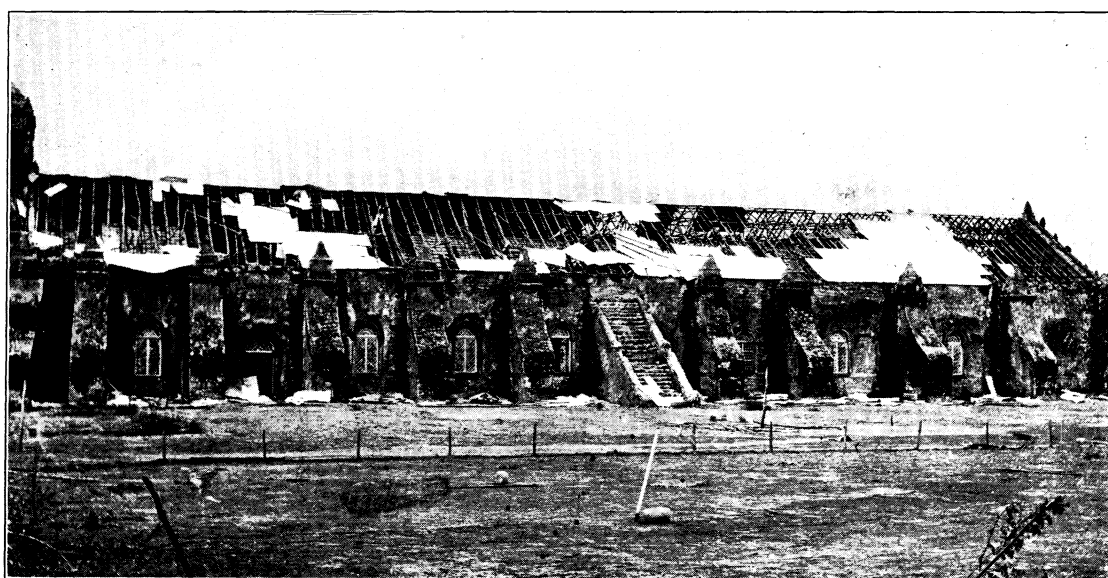
The church, Badoc, Ilocos Sur.

EFFECTS OF THE TYPHOON IN ILOCOS, MAY 9, 1913.





The intermediate school, San Nicolas, Ilocos Norte.



The church, Paoay, Ilocos Norte.  
EFFECTS OF THE TYPHOON IN ILOCOS, MAY 9, 1913.







The municipal building, Batac, Ilocos Norte.



The church and convent, Sinait, Ilocos Sur.

EFFECTS OF THE TYPHOON IN ILOCOS, MAY 9, 1913.



## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes es para todas las estaciones algo menor que la de Mayo del año pasado. Las presiones más altas se observaron casi en todas partes el 17 ó 18: las más bajas ocurrieron el 5 o el 6 en el sur de Luzón, las Visayas y Mindanao, y el día 9 en el centro y norte de Luzón. La temperatura media mensual es también menor que la del año pasado. La de Manila se diferencia de la normal de este mes es  $-1.0^{\circ}$  C., y de la de Mayo, 1912, en  $-1.6^{\circ}$  C.

**Precipitación acuosa.**—Examinando los totales de lluvia de este mes, hallamos que sólo ocho estaciones lo dan menor que para Mayo del año pasado. Sin embargo, comparando los mismos valores con la lluvia normal de Mayo, resulta un número total de diferencias positivas exactamente igual al de las diferencias negativas. Recuérdese que Mayo de 1912 fué un mes relativamente bastante seco. La cantidad de agua recogida en los pluviómetros de Manila es 40.5 mm., mayor que la del año pasado en 19.6 mm., y menor que la normal de Mayo en 68.7 mm.

## DEPRESIONES Y TIFONES.

Dejando aparte otras depresiones o áreas de baja presión de poca o ninguna importancia para Filipinas, vamos a discutir con alguna detención el tifón que desfogó en Filipinas y sus alrededores del 4 al 10 de este mes.

## TIFÓN DE SÁMAR E ILOCOS, 3 A 11 MAYO, 1913.

**Trayectoria de este tifón típica del mes de Mayo.**—La trayectoria seguida por este tifón ha venido a confirmar una proposición que teníamos ya como muy probable después de los muchos años que llevamos de experiencia de los baguios o tifones en Filipinas. Dicha proposición puede formularse en los siguientes términos: "Cuando en el mes de Mayo un tifón atraviesa las Filipinas por Mindanao o las Islas Visayas, es decir, entre los paralelos 6 y 13, moviéndose al W o WNW, puede tenerse como muy probable que recurvará en el Mar de China antes de llegar al Continente; y si la recurva tiene lugar antes de llegar el vórtice al meridiano  $115^{\circ}$  E de Greenwich, puede temerse con mucho fundamento que el tifón atraviese segunda vez el Archipiélago por el norte de Luzón en la segunda rama de su parabólica trayectoria." Desde luego se echa de ver la grande importancia de este enunciado, sobre todo para capitanes de barcos que navegan por el Mar de China o por los mares de Filipinas. Así, por ejemplo, si un capitán hubiese salido de Manila para Hongkong o para Formosa o el norte de Luzón el día 7 de Mayo de este año, cuando el tifón se hallaba en el Mar de China al W de Luzón, es evidente que hubiese podido ser sorprendido por el mismo en su movimiento de avance hacia el NE después de la recurva. Y la sorpresa sería tanto mayor cuanto mayor fuese la seguridad que tuviese dicho Capitán de que el tifón se alejaba definitivamente de Filipinas en dirección al Continente.

En la Lámina I verán nuestros lectores la trayectoria del presente tifón y justamente las de otros cinco del mismo tipo estudiadas por el Observatorio de Manila desde 1890 hasta el presente. Dos de ellos recurvaron antes de llegar el meridiano  $115^{\circ}$  y atravesaron segunda vez el Archipiélago, como el de este año, por la parte norte de la Isla de Luzón. Los otros tres recurvaron más lejos y se dirigieron en la segunda rama de la parábola a Formosa o a los alrededores de dicha isla. Todos estos tifones ocurrieron en el mes de Mayo. A esto podríamos añadir (1) que son contadísimos los casos de trayectorias parecidas observadas en otros meses del año; y (2) que apenas podemos recordar ningún caso de tifones que habiendo atravesado Mindanao o las Visayas en dirección al W o WNW, en el mes de Mayo, conservasen poco más o menos dicha dirección, sin recurvar, hasta llegar al Continente.

**Origen del tifón.**—Pertenece este tifón, al igual que el de Cebu del año pasado, al tipo de los que se forman bastante cerca de Filipinas sin que ejerzan apenas influencia alguna en las Carolinas Occidentales. Y no sólo en las observaciones de Carolinas, sino también en las de las islas Palaos que recibimos a su tiempo por correo, no se nota cosa alguna que pueda tomarse o señalarse como indicio cierto ni aún probable de este tifón. De ahí qué supongamos en la Lámina I que se formó este baguio el día 3 en los alrededores del meridiano  $130^{\circ}$  ó  $131^{\circ}$  E de Greenwich y del paralelo  $10^{\circ}$  N.

**El tifón en Sámar y Leyte.**—No hay duda ninguna que estos tifones que se forman cerca de Filipinas son los más temibles en cuanto que dan muy poco tiempo para ser anunciados con la debida anticipación a las islas o estaciones más orientales del Archipiélago. Por esta causa es muy digna de alabanza la prontitud y acierto con que el inteligente observador de Borongan, Rev. P. Fr. Cesáreo Montes, O. F. M., aún antes de recibir ningún aviso del Observatorio de Manila, anunció un tifón peligroso para Sámar la madrugada del día 4. Referiremos con sus mismas palabras los indicios que le movieron a anunciar este baguio al público y autoridades de aquella población:

El baguio que cruzó esta Isla de Sámar el día 5 parece ser del tipo de aquellos que se forman cerca o muy cerca de Filipinas. Ninguna señal cierta de baguio se notó antes del día 3. A las 7 p. m. de dicho día se observó el primer indicio marcado y seguro de baguio, y fué la mar gruesa del SE que continuó sin interrupción toda la noche. En las primeras horas de la mañana del día 4 se vió *claramente* que un tifón bien desarrollado se hallaba al SE, pues los Cu.-N. que corrían del norte con gran velocidad y la mar cada vez más gruesa que venía del SE, eran señales infalibles de un temido baguio. Ante este peligro se avisó al público y autoridades con la siguiente nota: "Un baguio se halla en el Pacífico al SE. Preparémonos como de costumbre, por ser peligroso para Sámar."

Lo observado en Borongan la mañana del día siguiente justificó plenamente los avisos preventivos del P. Montes. Son tan interesantes los datos que nos da en su *report* este observador así sobre la intensidad con que desfogó allí este baguio como sobre el punto de la costa de Sámar por donde penetró el vórtice en aquella isla que no creemos poder dispensarnos de copiarlo aquí casi íntegro.

En las primeras horas de la mañana del 5 viendo que el barómetro bajaba decidida y rápidamente y que la mar se presentaba ya muy borrascosa se avisó al público por bandillo que "el baguio se acercaba a Borongan por el S y que el peligro era inminente."

Los vientos más fuertes y destructores fueron aquí del NE, ENE, E y ESE. A las 9 a. m. los vientos huracanados comenzaron a derribar casas, destechar edificios y tronchar cocos no perdonando este baguio las casas y edificios que baguios anteriores habían respetado. Calma absoluta vortical no se ha observado: los vientos continuaron rolando, aunque con menor fuerza (8 a 9 de la escala Beaufort). A las 10.40 a. m., hora de la mínima barométrica, se vió esa claridad opalina que se suele observar en las cercanías del vórtice. Este debió de pasar por Hernani y Llorente, pues, según noticias de dichos pueblos, hubo allí calma completa por espacio de media hora entre 9 y 10 a. m., saltando después el viento al ESE. Coincide esto perfectamente con la claridad observada en Borongan a 10.40 a. m. Los vientos más fuertes en Hernani y Llorente (Lanang) fueron los del NE, ENE y ESE. En Pambujan, al contrario, los vientos fueron del NW desde la tarde del día 4, rolando después al W y SW.

Cuanto a la subida del mar, no se ha notado en esta costa la ola que en casos extraordinarios se ha visto y sentido durante el paso de otros baguios. Sin embargo, el oleaje del huracán era extraordinario y grande, subiendo su empuje hasta el interior de los ríos, formando en la línea de encuentro una como trinchera entre el empuje del oleaje y la fuerza de la corriente del río procedente de las grandes avenidas.

Desgracia personal no ha habido ninguna en esta población. Los daños materiales son incalculables, pues además de las casas destruidas y edificios destechados, toda plantación ha quedado arrasada y sin vida.

Para que nuestros lectores puedan formarse por sí mismos alguna idea de la forma e intensidad de este tifón al atravesar la Isla de Sámar, damos en el texto inglés (1) las observaciones hechas los días 4 y 5 de Mayo en las estaciones de Guiuan, Borongan y Tacloban; (2) las isobaras de 2 p. m. del día 5, cuando el vórtice se hallaba entre Catbalogan y Tacloban cerca y al sur de la bahía de Maqueda (Lámina II); y (3) copias de

las curvas barográficas de Guiuan, Borongan, Tacloban, Catbalogan y Calbayog (Lámina II).<sup>1</sup>

El observador de Tacloban, capital de la Isla de Leyte, describe así los efectos del temporal en aquella población:

Fueron 10 por ciento las casas tumbadas. De las demás la mayor parte quedaron destechadas y las otras inclinadas al este. Se perdieron algunas embarcaciones pequeñas, todos los corrales de pesca fueron barridos por el huracán, los pantalanos se destecharon en parte, el cuartel de los Scouts y demás edificios más sólidos de la población quedaron también destechados en parte y la iglesia provisional se fué abajo.

El tifón a través de los mares interinsulares entre Luzón y Visayas.—Después de haber atravesado la parte meridional de la Isla de Sámar con mucha lentitud y en dirección al W $\frac{1}{4}$ NW, durante la mañana del día 5, fué siguiendo el tifón su curso con la misma lentitud y conservando la misma dirección a través de los mares interinsulares entre Luzón y las Visayas, hasta que se internó en el Mar de China, la mañana del día 7, después de haber atravesado la parte sur de la Isla de Mindoro. Parece cierto también que el vórtice tocó algo la Isla de Masbate por el sur, y atravesó casi por el centro la isla de Tablas. Véase la Lámina II donde damos las isobaras de 2 p. m. del día 6 y la parte de trayectoria comprendida desde 10 p. m. del 5 hasta 6 a. m. del 7. En la misma lámina incluimos las curvas barográficas de Masbate y Romblón.

La mínima barométrica de Romblón fué 738 mm. próximamente y coincidió con una hora o algo más de calma relativa que empezó a observarse a eso de 11 a. m. del día 6. Después de 12 m. d. soplaron por unas tres horas vientos de fuerza huracanada del ESE. Comparando las observaciones de Romblón con las de Borongan, Guiuan y Tacloban, se echa de ver fácilmente que el vórtice había perdido algo de su desarrollo y profundidad cuando pasaba a la menor distancia de Romblón. Por lo que diremos luego se verá que de nuevo hubo de desarrollarse y profundizarse más en el Mar de China.

Hemos dicho que se movía este tifón con lentitud al atravesar las islas y mares interinsulares al sur de Luzón. Para probar esto bastará decir que desde 2 p. m. del 5 hasta 2 p. m. del 6, o sea en 24 horas, solamente anduvo unas 180 millas náuticas, lo cual da una velocidad media de solas 7.5 millas por hora.

Recurva del tifón en el Mar de China.—A pesar de esta lentitud con que se movía este baguio los días 5 y 6, todavía disminuyó su velocidad de traslación en el Mar de China, al propio tiempo que iba verificando una completa recurva al W de Luzón durante los días 7 y 8. Nos han servido para trazar esta parte de la trayectoria, además de las observaciones de las estaciones situadas en la costa occidental de Luzón, las que se hicieron a bordo de varios barcos que se hallaron cerca del vórtice o en el mismo vórtice, y más particularmente las que agradecemos a los capitanes de los vapores *Salahadji*, *Taming* y *Inaba Maru*.

La ruta seguida por el *Inaba Maru* desde Hongkong a Manila, juntamente con la dirección y fuerza de los vientos encontrados, va incluída en la Lámina I. La mínima barométrica fué 731.66 mm. y se observó a las 3 a. m. del día 9. Las observaciones hechas a bordo de los otros dos vapores *Salahadji* y *Taming* son tan interesantes que hemos creído necesario publicarlas en dos largas tablas que verán nuestros lectores en

<sup>1</sup> Teníamos preparada ya para la imprenta la discusión de este tifón, cuando recibimos del Hon. Gobernador de Sámar, D. Vicente Jazmines, copias certificadas que le habíamos pedido de todos los *reports* y telegramas recibidos de los presidentes de varios municipios de la provincia sobre los efectos causados por este tifón del 5 de Mayo. En la imposibilidad de reproducir aquí estas estadísticas diremos solamente que de ellas se deduce (1) que los efectos destructores de este baguio se sintieron prácticamente en toda la mitad meridional de la Isla de Sámar; y (2) que estos efectos fueron de mayor consideración en los pueblos de la costa oriental que en los de la costa occidental, lo cual probaría que el tifón había perdido algo de su intensidad al atravesar aquella isla.

el texto inglés. Lo ocurrido al vapor *Salahadji* que permaneció por espacio de unas diez y siete horas en las cercanías del vórtice llevado por la fuerza del huracán desde la Isla Cabra hasta cerca de Vigan, creemos puede llamarse con toda probabilidad un caso jamás experimentado por otro barco en toda la historia de los tifones del Extremo Oriente. Por el interés que este hecho despierta y para mejor inteligencia de las observaciones que publicamos, damos en el texto inglés una larga relación de este acontecimiento preparada por el P. Roberto Brown, S. J., del Observatorio, y publicada en "The Manila Times" del 20 de Mayo. En el mismo periódico apareció un breve artículo del R. P. José Algué, Director del Observatorio, del cual copiamos las siguientes líneas referentes a lo experimentado por el vapor *Taming* en este mismo tifón:

La rapidez con que bajaba el barómetro en el Mar de China era tan grande, que a bordo del *Taming* se observó una bajada de unos 20 mm. en el intervalo de una hora antes que entrase el barco en el vórtice, poco después de las 11 p. m. del día 8. Siendo el graduante barométrico tan extraordinario, fácil es de imaginarse la terrible furia con que debían de soplar los vientos. No es de extrañar, por consiguiente, que el Capitán G. H. Pennefather confesase que en los 20 años que lleva de navegar por el Mar de China jamás se había encontrado con un temporal tan violento como este. \* \* \*. El *Taming* se halló dos veces en el vórtice: una entre 11 y 12 m. n. del 8 y otra a las 7.30 a. m. del 9, hora en que se observó la mínima barométrica 712.46 mm.

**El tifón en Ilocos.**—El día 8 anunció el Observatorio la recurva del tifón, enviando los avisos oportunos y mandando izar las señales correspondientes en las estaciones de las provincias de Ilocos y Cagayán, a fin de que se previniesen con tiempo contra el peligro que las amenazaba. En la trayectoria de este tifón (Lámina I) se ve que efectivamente el tifón vino a atravesar la parte noroeste de Luzón en su movimiento de traslación al ENE y NE. El vórtice penetró en la isla por un punto que podría llamarse límite entre la Provincia de Ilocos Norte y la de Ilocos Sur, siendo los pueblos de la parte sur de Ilocos Norte y los de la parte norte de Ilocos Sur los que más de lleno sufrieron los efectos destructores del huracán.

El observador de Vigan y otros testigos presenciales están contestes en afirmar que fué éste uno de los tifones más desastrosos que han visitado aquella región. El observador de Laoag decía en uno de sus *reports* sobre este baguio que "sufrieron mucho los efectos del huracán los pueblos situados en la parte sur de la provincia como San Miguel, Dingras, Batac, Paoay, Currimao y Badoc y que casi todas las casas de los tres últimos municipios se vinieron abajo dejando sin hogar muchísimas familias." Lo mismo podría decirse de los dos pueblos Sinait y Cabugao situados en la parte más septentrional de la costa de Ilocos Sur, según se desprende de otro *report* del observador de Vigan y de otras cartas de particulares que han llegado a nuestras manos.

El R. P. José Clotet, S. J., profesor del Colegio-Seminario de la Inmaculada Concepción en Vigan, escribía entre otras cosas lo siguiente en carta de 15 de Mayo al P. Director del Observatorio:

Eran tan fuertes y bravas las rachas del viento del Sur que no recuerdo yo haberlas experimentado tan fuertes en toda mi vida. \* \* \*. Muchos de Vigan dicen que es uno de los baguios más fuertes que aquí se han sentido en muchos años. \* \* \*.

Ahora mismo acabo de hablar con el español D. Salvador Rivero que ha ido hasta Badoc, y me ha contado horrores de Sinait y Badoc, pues más allá ya no se puede pasar. Entre Sinait y Badoc los postes de hierro del telégrafo han quedado unos doblados formando un gancho, otros retorcidos tres y cuatro veces sobre sí mismos; los plátanos no tumbados, sino cortados como por un bolo dejando en pie como metro y medio. En Badoc había más de 13 casas de piedra, tabla y zinc: pues bien, ni una sola se salvó. Sólo han quedado paredones y piso de tabla y aún esto en muy mal estado. Ha habido víctimas en todos estos pueblos mencionados. En Badoc unas planchas volando mataron al presidente y una hijita suya en el momento en que iban a refugiarse a otra parte más segura. En fin, el baguio ha sido desastroso. Presidencias y otros edificios fuertes han quedado muy dañados y en ruínas.

Un viray que salió de Santo Domingo para Cabugao con 17 personas se dice que se perdió con todos sus pasajeros. \* \* \*.

De otra carta de un vecino de Paoay dirigida al R. P. José Alfonso, S. J., Rector del Colegio de Vigan ya citado, tomamos las siguientes líneas:

Verdaderamente aterrador fué el ímpetu del ciclón que pasó por nuestro pueblo. Prueban esta aserción los incalculables destrozos que causó en los pueblos vecinos y en el nuestro. Más de 3,000 casas comprendidas todas en nuestro municipio fueron destruídas y arrasadas. Así es que millares de hombres y mujeres, niños y ancianos se encuentran hoy sin hogar, viéndose precisados unos a dormir debajo de los árboles, y otros debajo de un humilde tugurio que pudo levantar su desgracia.

Según estadísticas tomadas por nuestro observador de Laoag en la oficina del gobernador provincial de Ilocos Norte, los efectos del baguio en la provincia son como siguen:

Personas muertas .....	20
Personas gravemente heridas.....	30
Casas enteramente destruídas.....	22,076
Casas destechadas.....	2,998

En estos informes no van incluídas las presidencias, iglesias, mercados y escuelas públicas que fueron igualmente destruídas o destechadas.

La pérdida total de la provincia se calcula en ₱1,832,918.<sup>1</sup>

Por lo que toca a Ilocos Sur tomamos los siguientes detalles de un telegrama del gobernador provincial al Secretario Ejecutivo:

En los pueblos al sur de Vigan desde Santa Cruz a Santa los daños han sido insignificantes.

En los otros pueblos al Norte desde Caoayan y Vigan hasta Sinait los daños han sido grandes y las pérdidas materiales se calculan en ₱489,778.

Sigue luego dando detalles de cada uno de los pueblos en la región indicada. Nos contentaremos con copiar lo que se dice de los dos pueblos más castigados, que fueron Cabugao y Sinait:

*Cabugao*.—Fueron completamente destruídas 336 casas de materiales fuertes y mixtos. Fueron volados los techos de hierro galvanizado de la presidencia, convento, iglesia y otras casas de materiales fuertes. Lo restante de las casas de la población sufrieron mucho, aunque no fueron totalmente destruídas. Hubo una persona muerta y cinco heridas, tres de ellas gravemente. El total de las pérdidas materiales se avalúa en ₱30,000.

*Sinait*.—De 421 casas que tenía la población 341 de materiales fuertes, mixtos y ligeros fueron completamente destruídas, y aún paredes de mampostería fueron echadas a tierra. Hubo cinco personas muertas y cinco heridas. Las pérdidas materiales de este municipio se calculan en ₱418,740.

En el mismo telegrama se da cuenta de varios desastres marítimos, de los cuales citaremos sólo los más notables.

La banca *Federico*, propiedad de D. Pedro Fabre de Vigan, estando anclada en Sulvec, puerto de Narvacan, fué hecha pedazos por la furia de las olas pereciendo ahogadas once personas que había en ella.

El pailebot *César* cargado de azúcar, propiedad de D. Gregorio Sy Quia naufragó en frente del puerto de Pandan habiendo desaparecido sin duda ahogadas 4 de la tripulación, salvándose los demás.

La banca *Astronomía*, propiedad de un vecino de Caoayan, fué echada contra las rocas de la costa de San Vicente, pereciendo ahogados cinco pasajeros.

El parao *Santa Clara* que venía de Dagupan naufragó en las costas de Lapog, habiendo perecido ahogados 17 entre tripulación y pasajeros.

Gracias a la solicitud de nuestros observadores de Vigan y Laoag, podemos ofrecer a nuestros lectores en las Láminas III, IV y V varias vistas tomadas después del baguio en los pueblos mencionados. Algunas de estas vistas fueron ofrecidas al observador de Laoag por Mr. R. L. Somers, supervisor del "Singer Sewing Machine Co."

En el texto inglés ofrecemos en una tabla las observaciones hechas durante este baguio en las estaciones de Vigan, Laoag y Aparri. Según estas observaciones, se ve que el tifón una vez verificada la recurva se movió con mayor velocidad, no sólo que

<sup>1</sup> Dudamos si en esta cantidad se han incluído o no las pérdidas de los edificios públicos a que se hace referencia en el párrafo anterior.

en el Mar de China, sino también que cuando atravesaba las Islas Visayas. Esta velocidad al cruzar el norte de Luzón era de unas 8.7 millas por hora.

Completamos los datos referentes a este tifón incluyendo en la Lámina I las isobaras de 6 p. m. del día 9 cuando el vórtice se hallaba ya dentro de Luzón al SE de Laoag, y también las curvas barográficas obtenidas en las estaciones de Laoag, Vigan y Aparri.

Nos faltan datos bastantes para seguir con exactitud el curso ulterior de este tifón después de haber cruzado el norte de Luzón y las Islas Babuyanes (véase la Lámina I). Sin embargo, suponemos como muy probable, a juzgar por las observaciones de Aparri y de Santo Domingo, Islas Batanes, que se movió al E el día 10, y que se deshizo el 11 cerca del paralelo  $20^{\circ}$  N y entre los meridianos  $125^{\circ}$  y  $130^{\circ}$  E de Greenwich.

**Avisos de tifón del Observatorio de Manila.**—Terminaremos la discusión de este baguio copiando aquí los avisos de tifón enviados como de costumbre a los observatorios de Tokio, Zikawei, Taihoku, Hongkong y Phulien.

Día 4, 4.45 p. m.: Tifón al E de la parte norte de Mindanao, dirección desconocida.

Día 5, 8.40 a. m.: Tifón al E de las Islas Visayas, moviéndose al W o WNW.

Día 5, 5.45 p. m.: Tifón cruzando las Islas Visayas, moviéndose al W o WNW.

Día 6, 9.40 a. m.: Tifón en los alrededores de  $122^{\circ}$  Long. E y  $12^{\circ}$  Lat. N, moviéndose al WNW.

Día 7, 8.40 a. m.: Tifón en los alrededores de  $120^{\circ}$  Long. E y  $13^{\circ}$  Lat. N, moviéndose al WNW.

Día 8, 9.25 a. m.: Tifón en los alrededores de  $116^{\circ}$  Long. E y  $15^{\circ}$  Lat. N, inclinándose al N.

Día 9, 9.50 a. m.: Tifón al W de la parte norte de Luzón, distancia mayor de 100 millas, moviéndose al NNE o NE.

Día 10, 7.45 a. m.: Tifón al N de Aparri, moviéndose al NE.



METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.			Free expo- sure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.				
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.
1	757.37	28	34.5	23.5	30.7	32.1	30.4	30.6	29.3	28.8	65.9	18.3	6.3	4.8
2	57.95	26.9	33.5	22	30.6	31.7	30.8	31	29.3	28.8	72.3	19	4.1	3.4
3	59.03	26.4	33.2	21.6	30.2	31.5	30.8	30.8	29.3	28.7	75.3	19.2	4.3	3.1
4	58.19	27	33.2	22.2	30.2	31.7	30.7	30.7	29.3	28.8	76.8	20.1	4.5	3.5
5	57.23	27.8	34	23.3	30.5	32.4	30.8	30.9	29.4	28.8	72.8	19.9	4.9	4
6	56.11	25.7	29.3	23.9	30.4	30.5	30.8	30.8	29.3	28.7	83.7	20.6	1.7	1.9
7	56.01	26.2	29	23.9	29.1	29.5	30.2	30.3	29.3	28.6	83.1	20.9	3.5	2.7
8	56.53	26.5	31.1	24.7	28.7	29.6	29.9	29.9	29.4	28.6	86.4	22.1	1.7	1.4
9	56.56	26.2	29.5	24.6	28.6	29.3	29.7	29.7	29.4	28.6	89.1	22.4	1.3	1.5
10	57.34	27.3	31.5	24.8	28.5	30.1	29.6	29.8	29.4	28.7	85.9	23.1	3.4	2.4
11	58.53	27.4	31.9	24.5	29.5	30.9	29.8	30.2	29.4	28.6	83.8	22.6	7	4.8
12	59.33	28.1	33.2	23.6	29.8	31.4	30.2	30.6	29.4	28.8	79.7	22.3	4.5	3.4
13	58.64	27.9	33.5	23.7	30.4	31.9	30.8	30.8	29.4	28.9	79.8	22.1	5	3.1
14	57.93	27.7	32.8	23.4	30.8	32	30.9	31.2	29.4	28.8	81.5	22.4	4.3	2.9
15	58.33	28	32.9	23.9	31	32.6	31.2	31.3	29.5	28.9	80.8	22.6	4.1	2.7
16	59.23	27.6	32.9	23.8	31.4	33	31.3	31.6	29.5	28.9	81.2	22.1	4.4	3
17	59.72	27.4	34	23.1	31.5	33.2	31.4	31.7	29.5	29	76.5	20.6	4.8	3.4
18	59.70	27.9	35.4	23.7	31.6	32.5	31.7	31.8	29.6	28.9	78	21.6	4.5	3.1
19	59.40	28.7	34.8	23.2	31.7	33.5	31.7	31.8	29.7	28.9	70.5	20.3	6.1	4.5
20	59.23	27.3	34.1	23.6	31.9	33	31.8	31.8	29.7	28.9	79.8	21.4	3.3	2.7
21	58.78	27.8	35	22.9	30.7	33	31.5	31.8	29.7	28.9	69.9	19	6.6	5.1
22	58.72	27.5	34.9	20	31	33	31.3	31.8	29.6	28.9	64.9	17.4	6.8	5.2
23	57.83	28.1	34.3	23.6	31.4	33.5	31.4	31.8	29.7	28.9	73.3	20.6	4.7	3.7
24	57.48	28.2	34.5	23.1	31.3	33	31.5	31.8	29.9	29	71.2	20	5.7	4.1
25	58.51	28.2	34.8	23.7	31	33.3	31.4	31.9	29.9	28.8	72.9	20.4	4.3	3.2
26	59.28	26.8	34	23.7	31.3	32.5	31.5	31.8	30	29	82.2	21.3	2.6	2.1
27	59.28	26.4	32.2	23.8	30.2	31.5	31.1	31.3	29.9	29	85.2	21.8	1.3	1.5
28	58.22	27.9	35.4	23.5	29.6	32	30.8	31.3	29.9	28.9	77.4	21.2	3.8	3.1
29	58.04	27.5	34.9	22.7	30.5	31.7	31	31	30	29	77.1	20.9	4.4	3.6
30	58.93	27.7	34.9	22.1	29.8	31.8	30.8	30.9	29.9	29	71.4	19.3	5.6	4.6
31	58.98	27.9	35	22.5	30.1	32.2	30.8	31	30	29	72.4	20	5.1	4
Mean	758.27	27.4	33.4	23.3	30.5	31.9	30.9	31.1	29.6	28.8	77.4	20.8	4.3	3.3
Total													134.6	102.5
Departure from normal	-0.10	-1.0	-0.1	-0.6							+1.3	-0.9		

Day.	Wind.				Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.
	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.		Form and its direction.				
						Upper.	Lower.			
		Km.	Km.		0-10.			h. m.	mm.	
1	SSE	185	19	SSE	3.4	Ci.	Cu.	E	10 15	
2	E quad.	175	15	N	6.6	Ci.	Cu.	E	7 20	1
3	NE, SE	215	23	SE	5.4	Ci.	Cu.-N.	E	5 55	p° p.
4	E quad.	146.5	17.5	ENE	7.1	A.-Cu.	EbyN	Cu.	8 25	d° ∩ p.
5	NE	178	14.5	WSW	7.1	Ci.	Cu.	E	7 35	∠ p.
6	N, NNE	382	34	NNE	10	Ci.-S.	Cu.-N.	ENE	0 20	●° d. a. p.
7	ESE	323	27.5	ESE	9.8	A.-S.	Variable	SE	0 00	●° d. a. p.
8	ESE	183.5	26	SE	9.5	Ci.-S.	S.-Cu.	SE	0 00	●° ∩ p.
9	SSW	240	21	SSW	10	Ci.-S.	Fr.-N.	SW	0 00	d. a. ●° a. p.
10	WSW	326	27	SW	8.8	Ci.-S.	cu. ssw, wsw		6 00	● a.
11	WSW	228.5	26	WSW	7.3	Ci.-S., A.-Cu.	NE	SW, W	6 20	
12	WSW	157.5	20	WSW	2.8	Ci.	Cu.	W	11 00	
13	W quad.	170.5	19	SW	2.1	Ci.	Cu.		11 10	
14	WSW	207.5	21	SW	1.9	Ci.	Cu.		10 30	
15	SW quad.	246	25	SW	3.1	Ci.	Cu.	SW	8 45	
16	W, WSW	191.5	29	WSW	2.9	Ci.	Cu.	SW	10 10	
17	W quad.	174	21	WSW	3.8	Ci.	Cu.	E	8 50	∩ p.
18	W quad.	164	14.5	W	5.4	Ci.-S.	SEbyS	Cu.	7 30	∞ a. ∩ p.
19	W, ESE	183	21	W	3.5	Ci.	Cu.	E, ESE	10 35	
20	WNW	136.5	17	NNE	6.2	Ci.	Cu.	E	6 40	p° ∩ p.
21	SE	205	18	SE	4.8	A.-Cu.	Cu.	E	7 25	
22	ENE, WNW	206.5	19	NE	3.7		Cu.-N.	E	9 15	∩ p.
23	E quad.	150	20	WNW	6.8	Ci.	Cu.	E	5 10	p° p.
24	SE quad.	181.5	17	WNW	7.7	Ci.-S.	Cu.	E, ESE	5 30	
25	Variable	112	14	SSE	8.4	Ci.-S.	Cu.	E	2 00	∩ p.
26	NNE	154.5	19	WNW	8.2	Ci.	Cu.	E	4 05	∩ p.
27	N, NNE	166	17	NNE	9	A.-Cu.	EbyS	Cu., N.-cf.	1 50	∩ p.
28	NNE, SSE	176.5	16	SSE	6.8	Ci.	Cu.	E	7 10	≡ a. ●° ∠ p.
29	SE, ESE	105.5	17	ESE	5.1	Ci.	Cu.	E	7 15	∩ p.
30	E quad.	172	16.5	NW	3.8	Ci.-S.	Cu.	E	7 55	
31	NNE, SE	159	20	SE	7.1	Ci.	Cu.	E	5 35	
Mean		193.6	20.4		6.1				6 28	
Total		6,001.5							200 30	40.5
Departure from normal		-880.9			+0.4				-31 16	-68.7

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.

## METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.\*

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P.ct.	mm.		0-12.	0-10.			mm.	
1.	756.88	26.7	31.3	22.7	85.3	22	Variable	1.5	2.7	Ci.	Cu.	NE, SSE	d° a.
2.	57.10	26.9	31.2	23.3	81.7	21.3	SE quad.	1.2	3.3	Ci.	Cu.	SSE	
3.	57.91	26.6	30.7	23.6	86.3	22.2	Variable	.5	6.7	Ci.	Cu.	E	
4.	56.94	27.5	33.7	23.4	82.5	22.1	NE	1.7	6	Ci.-S.	Cu.	NE	d° p.
5.	55.33	27.8	31.3	24.7	79.2	21.8	NW quad.	1.5	8.2	Ci.-S.	Fr.-N.	NNW, NW	d° p.
6.	56.46	27.6	32.1	25.5	83.7	22.6	S	3.3	7.2	Ci.-S., Ci.	Cu.	SW quad.	2 a. 2° p.
7.	58.10	27.6	31.8	24.8	78.8	21.4	S	2.2	5	Ci.-S., Ci.	Cu.	SSW	
8.	57.97	27.3	31.4	23.1	82.5	22	SSE	1.3	3.8	Ci.	Cu.	S	
9.	57.83	27.5	32.7	22.8	81.3	22.1	SSE	1.5	3	Ci.	Cu.	S	2° p.
10.	58.42	27.8	31.3	24.8	83.3	23.1	SE, SSE	1.8	3.8	Ci.	Cu.	S	
11.	59.16	27.4	31.5	23.9	85	22.8	SSE, S	1	2.5	Ci.	Cu.	S	
12.	59.41	27.9	33.7	23.4	81.2	22.5	SE	.8	2	Ci.	Cu.	SSE	
13.	58.80	27.4	32.3	23.8	85.2	22.9	SE	1.5	2.8	Ci.	Cu.	SSE	
14.	58.19	27.8	32.5	24	82.3	22.6	SE, SSE	1.7	3.2	Ci.	Cu.	S	
15.	58.79	27.9	32.7	24.1	81.7	22.5	SE	1.7	3.2	Ci.	Cu.	S	
16.	59.44	27.5	33.3	23.4	82.3	22.1	SE	1.3	3.5	Ci.	Cu.	SE quad.	
17.	59.96	27.3	32.5	23.4	84	22.4	SE	1.2	2.8	Ci.	Cu.	S, SSE	
18.	59.58	27.2	32.7	23.2	83.2	22	SE	1.5	4.3	Ci.	Cu.	SSE, S	d° a.
19.	59.12	26.8	31.7	23.8	87.7	22.7	E quad.	1.3	4.3	A.-Cu.	Cu.	SSE	4.7 2° p.
20.	58.84	27.1	31.5	23.1	84.5	22.3	SE	1.2	3.2	Ci.	Cu.	ESE, S	
21.	58.12	28	33.3	23	80	22	ESE	.5	3.2	Ci.	Cu.	SE	
22.	57.99	27.6	32.9	23.8	80.7	21.9	SE	.8	7.7	Ci.-S.	Cu.	E, SSE	
23.	57.44	27.7	32.4	23	83.3	22.8	ESE	1	6.2	Ci.-S.	Cu.	SSE	
24.	57.54	26.6	30.6	24	89.3	22.8	E quad.	1.7	7.5	Ci.-S.	Cu.	E, S	2° d° p.
25.	58.96	27	30	24.4	89.2	23.5	SSE	1	8.7	Ci.-S.	Cu.	S quad.	d° a.
26.	59.14	27.5	32.6	23.7	82.8	22.3	SE	1.2	6	Ci.-S., Ci.	Cu.	S	
27.	58.75	27.6	32.6	24.1	82.5	22.4	S	1.3	2.7	Ci.	Cu.	SSE, S	
28.	57.957	27.2	32	23.8	84	22.4	S, NW	1	3.8	Ci.	Cu.	SW quad.	
29.	58.02	27	33.3	23.9	84.8	22.4	SSE, NNW	1	4.3	Ci.	Cu.	SSW	2° p.
30.	58.44	25.8	31.7	23.3	90.3	22.1	SE, SSE	.7	6	Ci., Ci.-S.	Cu.	SSE	9.9 d° 2 a.
31.	58.40	25.9	31.5	23.1	87.2	21.5	E	.5	7.5	Ci.-S.	Cu.	SE quad.	1 2° p.
Mean	758.23	27.3	32.1	23.7	83.7	22.3		1.3	4.7				
Total												15.6	

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
1.	756.82	27.4	31.6	24	84.2	22.8	ENE	Km. 250.4	0-10. 5.7	Ci.-S.	Cu.-N.	SE	mm.	
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														
11.														
12.														
13.	59.07	27.9	31.9	23.7	77	21.4	ENE	199.5	2.5	Ci.-S.	Cu.			
14.	58.37	28.1	32.5	23.9	77	21.7	ENE	181.3	2.5	Ci.-S.	Cu.			
15.	58.81	28.6	33.7	24.5	75.7	21.7	NE, NNE	138.7	2.2	Ci.-S.	Cu.			
16.	59.43	28.3	33.5	24	75.3	21.4	E	144.9	1.7	Ci.-S.	Cu.			
17.	59.88	28.2	33	24	78.2	22.1	E	188.2	1.8	Ci.-S.	Cu.			
18.	59.88	27.8	32.5	23.9	77.3	21.4	ENE	178.6	3.3	Ci.-S.	Cu.			
19.	59.60	26.6	29	24	81.8	21	E quad.	173.9	6.7	Ci.-S.	Cu.-N.	SE	2.6	●° d p.
20.	58.94	27.5	31.6	23.5	76.7	20.8	E quad.	177.2	6	Ci.-S.	Cu.-N.	SE	1.5	d° a. d p.
21.	58.38	27.7	32.1	24.4	76.7	21	E	224.2	4.7	Ci.-S.	Cu.-N.	SE		
22.	58.22	27	31.9	23.7	80.2	21.1	E	166.9	6.2	Ci.-S.	Cu.-N.	SE	17.6	d ●° p.
23.	57.63	26.9	31.4	23.9	80.7	21.2	E	173.1	7.3	Ci.-S.	Cu.-N.	SE	2.8	●° p.
24.	57.49	26.3	29.8	23.6	81.2	20.6	Calm	114.9	7.7	Ci.-S.	Cu.-N., S.-Cu.	SE	2.3	4 d° p.
25.	58.93	27.1	31.6	23.7	77.2	20.5	E	95.4	6.3	Ci.-S.	Cu.-N.	ESE	63.5	42 ●° p.
26.	59.09	27.4	31	22.9	77	20.7	E quad.	202.4	5.5	Ci.-S.	Cu.-N.	ESE		2° a.
27.	58.60	27.7	31.3	23.7	78.7	21.5	E	215.8	4.3	A.-Cu.	Cu.	ESE	6.6	● a.
28.	58.00	27.2	30.9	23.7	79.8	21.2	E	192.7	5.7	Ci.-S.	Cu.-N.	ESE	.8	d a. 2° a. p.
29.	58.33	26.5	29.9	23.7	81.2	20.8	E	215.4	7.2	Ci.-S.	Cu.-N.	ESE	.5	d a. 2° a. p.
30.	58.40	26.2	31	23.5	83.2	20.9	E	129.4	7.5	Ci.-S.	Cu.-N.	ESE	5	●° a. d° p.
31.	58.22	25.5	26.9	23.8	86	20.8	E	198.8	9.5	Ci.-S.	Fr.-N.	ESE	41.7	
Mean	758.60	27.3	31.4	23.8	79.3	21.2		178.1	5.2					
Total													144.9	

\* All the mean values given in these tables are deduced from six daily observations.

° 20 days of observation only.

## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	757.04	28.5	32	25.5	69	19.6	NE quad.	338.3	3	Ci.	Cu. NE	∞ ∞ p.
2.	57.23	28.5	32	25.5	67.5	19.4	N, NE	311.7	3	Ci.	Cu. ENE	∞ ∞ p.
3.	57.88	26.6	28.9	25.2	81.2	21.1	NE quad.	219.3	7.3		Cu.-N. NE	4.6 ∞ a. p. d p.
4.	56.80	27.6	31	25	77.3	21.1	W quad.	188.2	6.3	A.-Cu.	Cu., Cu.-N. NNE, N	3.1 ∞ a. p. p.
5.	54.56	26.9	28.6	25.5	75.2	19.7	W	472	9.2		Cu.-N. NW	4.5 d a. p. pp.
6.	55.93	26.6	28.1	23.9	81	21	SW quad.	804.7	7.8	Ci.-S., A.-Cu.	Cu.-N. SW	3.3 d a. p.
7.	57.95	27.7	31.9	24.5	76.7	21	SW	272.3	4.7	Ci.-S.	Cu. SE	d a. p.
8.	57.98	28	30.5	25	76.8	21.4	S	169.7	3.3	Ci.	Cu. SE	d a.
9.	57.86	28.3	31	25.9	74.2	21.1	SW quad.	284.6	3.7	Ci., Ci.-S.	Cu. S	d a. p.
10.	58.19	28.4	31.7	26	75	21.6	SW quad.	374.1	2.8	Ci.	Cu. SSW	∞ ∞ p.
11.	58.92	29.1	31.7	27	74.8	22.4	SW quad.	247.9	2.8	Ci.	Cu. SSW	∞ ∞ p.
12.	59.52	29	32.1	26.8	74.2	22	NE	281.6	2.8	Ci.	Cu. S, E	∞ ∞ p.
13.	58.76	29.2	32.6	26.5	68.5	20.5	NE	270.7	2.3	Ci.	Cu. NE	∞ p.
14.	58.16	28.9	32	26.8	72	21.2	Variable	268.1	2.5	Ci.	Cu. NE, E	4.6 ∞ a.
15.	58.67	29.3	33.3	26.7	73.3	22.1	Variable	223.1	2.8		Cu. E	∞ a. p.
16.	59.22	29	33.5	26	71.8	21.2	Variable	185.5	3.7	Ci.	Cu. E	∞ p.
17.	59.81	28.7	32.1	26.1	69.7	20.3	N quad.	283.2	3.8	Ci.	Cu. E	26.4 ∞ a.
18.	59.46	29.3	32.5	26.5	66.3	19.9	NE	328.7	3	Ci.	Cu. E	1.3 ∞ a.
19.	59.22	27.9	31.4	24.5	75	20.9	NE	270.5	6.7	Ci.-S.	Cu.-N. E	4.8 ∞ a.
20.	58.88	28.6	31.9	25.7	70.5	20.2	NE	319.7	3.3	Ci., Ci.-S.	Cu. E	∞ a. p.
21.	58.41	28.4	31	25.8	74.3	21.2	NE	396.7	4.2	Ci.	Cu. E	∞ a. p.
22.	58.06	28.5	31.9	25.5	71.3	20.4	NE	345.5	5.7	Ci.-S.	Cu. E	2.3 ∞ a.
23.	57.44	28.3	31.5	25.7	72.3	20.5	NE quad.	325	5	Ci.-S.	Cu., Cu.-N. E	13.7 ∞ a. p.
24.	57.48	27.5	30	25.5	78.2	21.2	Variable	211.4	6.8	Ci.-S.	Cu.-N. SSE	5 ∞ a. p.
25.	58.95	27.5	29.9	25	79.3	21.5	SW quad.	163.5	7.7	Ci.-S.	Cu. E	6.1 ∞ a. p.
26.	59.20	28.3	31	25.8	75.2	21.4	N	244.8	5.3	Ci.-S.	Cu. E	∞ a. p.
27.	58.84	28.4	31.1	26	75.7	21.6	NE	305.5	3.5	Ci.	Cu. E	∞ a. p.
28.	58.16	28.8	31.5	26.1	73	21.3	NE, E	333.3	3.3	Ci., Ci.-S.	Cu. E	∞ a. p.
29.	58.22	28.8	31.1	26	69.7	20.5	NE, E	327.5	3	Ci.	Cu. E	∞ a. p.
30.	58.63	28.6	31.5	25.9	70.8	20.5	NE	359.7	5.2	Ci., Ci.-S.	Cu. E	∞ a. p.
31.	58.46	28.1	31.8	25	72.3	20.3	NE	406	6.8	Ci., Ci.-S.	Cu.-N. ENE	8.4 ∞ a. p.
Mean	758.19	28.3	31.3	25.7	73.6	20.9		307.5	4.6			
Total								9,532.8				83.6

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	756.69	27.8	32	24.7	69.7	19.1	NE quad.	432.7	5	Ci.	Cu. NE	∞ p.
2.	57.02	27.5	31.5	23.6	71.8	19.4	NE quad.	425.2	5.2	Ci.	Cu. NE	∞ a. p.
3.	58.03	25.8	30.1	24.1	86.7	21.4	N	311.6	9.5	Ci.-S.	Cu.-N. NE	6.1 d a. p.
4.	57.03	27.9	32.1	24.1	73.2	20	NE	321.1	6.3	Ci.-S.	Cu., Cu.-N.	2.8 ∞ a. p.
5.	55.45	27.6	32.2	24.4	77.7	21.2	N quad.	308.9	9.7	Ci.-S.	Cu.-N., Cu.	78.4 d a. p.
6.	54.79	25.2	26.8	22.5	90.2	21.4	SW	503.6	10	Ci.-S.	Cu., Cu.-N.	∞ a. p.
7.	57.54	26.1	27.9	24.1	88.3	22.2	SW	238.9	9.3	Ci.-S.	Cu., Cu.-N.	∞ a. p.
8.	57.54	27.4	30.5	24.1	81.5	21.9	SW	233.9	6	Ci.	Cu. SW	1 ∞ a. p.
9.	57.55	27.5	30.3	24.5	83.5	22.6	SW	304.7	5.7	Ci.	Cu. SW	2.8 ∞ a. p.
10.	57.85	28	30.5	25.4	81.7	22.7	SW	312.2	5.8	Ci.	Cu. SW	∞ a. p.
11.	58.76	28.2	30.5	26.1	81	22.9	SW	267.7	4.2	Ci.	Cu. SW	∞ p.
12.	59.10	28.4	31.9	24.5	77	21.9	SW	181.1	2.7	Ci.	Cu. SW	d a. p.
13.	58.59	28.6	33.3	25.7	78.2	22.6	Variable.	206.7	3.3	Ci.	Cu. SW	3 ∞ a. p.
14.	57.78	28.4	32.4	25.5	73.7	21	N quad.	182.8	4.5	Ci.	Cu. SW	∞ a. p.
15.	58.40	28.1	31	25.5	79	22.1	SW	293.8	3.3	Ci.	Cu. SW	∞ a. p.
16.	59.08	27.8	31.5	24.4	78	21.6	SW	225	5.2	Ci.	Cu. SW	∞ a. p.
17.	59.08	28.1	33.7	23.5	71	19.8	N	173.8	6.2	Ci.	Cu. SW	∞ a. p.
18.	59.27	28.3	33	24.8	69.7	19.7	N, NE	275.8	6.8	Ci.	Cu. SW	∞ a. p.
19.	59.08	28.8	27.6	24.6	81.3	20.1	N	280	8.3	Ci.-S.	Cu. SW	1 ∞ a. p.
20.	58.42	28.4	33	23.9	70.3	19.9	N, NE	345.9	4.3	Ci.	Cu. SW	∞ a. p.
21.	57.85	28.6	32.1	24.1	72.2	20.7	N, NE	434.4	5.3	Ci.	Cu. SW	12.4 ∞ a. p.
22.	57.77	27.8	32	24.1	77	21	N, NE	374	7.8	Ci.	Cu. SW	∞ a. p.
23.	57.77	28.2	32.4	24.5	73	20.4	N	349.4	7.7	Ci.	Cu. SW	∞ a. p.
24.	57.18	27.3	32	24.8	76	20.4	N	242.1	9.7	Ci.-S.	Cu., Cu.-N.	19.5 ∞ a. p.
25.	58.69	25.9	29.3	22.9	85.8	21.2	SW, W	155.4	10	Ci.-S.	Cu.-N.	5 ∞ a. p.
26.	58.85	26.9	31	24.8	81.3	21.3	N quad.	163.2	9.8	Ci.-S.	Cu. SW	10.2 ∞ a. p.
27.	58.59	27.6	31.4	24.3	79.3	21.6	Variable.	169.9	8.2	Ci.	Cu. SW	7.1 ∞ a. p.
28.	57.90	27.5	32.1	23.5	81.3	21.8	N	177.4	7.2	Ci.	Cu., Cu.-N.	11.7 ∞ a. p.
29.	57.55	28.1	32.1	24.1	76.3	21.3	NE	288.4	4.5	Ci.	Cu. SW	∞ a. p.
30.	58.02	28.6	32.4	25.4	71.3	20.4	NE	366.5	5.5	Ci.	Cu. SW	∞ a. p.
31.	58.02	28.4	32.2	25.3	74.3	21.1	N, NE	539.1	5.7	Ci.	Cu. SW	∞ a. p.
Mean	757.91	27.6	31.3	24.4	77.8	21.1		293.1	6.5			
Total								9,085.2				156.5

*Meteorological data for first and second class stations—Continued.*

ORMOC.

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied,  $-1.83 \text{ mm}$ .]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.	Total movement in 24 hours.	Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
		Mean.	Maximum.	Minimum.						Prevailing direction.	Form and its direction.			Upper.	Lower.
mm.	°C.	°C.	°C.	P. ct.	mm.	Km.	0-10.	Ci.-S.	S	Cu.-N.	NE	mm.	☉ a. p. ☐ p.		
1.	756.96	27.2	32.7	21.6	75.8	19.9	NE quad.	168.2	6.2	Ci.-S.	S	Cu.-N.	NE	☐ d ☐ p.	
2.	77.21	26.8	32.3	21.1	79.5	20.6	NE	136	7.7	Ci.-S.	W	Cu.-N.		☐ a. p. ☐ p.	
3.	58.06	25.5	28.1	24.1	91.5	22.2	N quad.		9	Ci.-S.		Cu.-N.	ENE	☐ a. p. ☐ p.	
4.	56.68	26.5	32.1	23.5	86.7	22.2	NW quad.		8.7	A.-Cu.	NE	Cu.-N.	NNE	☐ a. p. ☐ p.	
5.	52.03	25.2	26.6	24.4	95	22.6	SW quad.	873.77	10	Ci.-S.		N.	W quad.	☐ a. p. ☐ p.	
6.	56.24	26.8	28.9	24.4	86	22.5	SE	539.87	10	Ci.-S.		Cu.-N.	SSE	☐ a. p. ☐ p.	
7.	58.08	26.8	30.5	22.4	82.5	21.4	S	123.4	6.8	A.-Cu.	SSE	Cu.-N.	S by E	☐ a. p.	
8.	58.12	27	31.1	22.5	83.2	21.8	SE	145.7	7	A.-Cu.	W, SSE	Cu.-N.		☐ a. ☐ 2 p.	
9.	57.94	27.3	30.5	23.4	83.3	22.2	SE	171	5.5	Ci.-S.	NW	S.-Cu.,	Cu.	☐ a. ☐ p.	
10.	58.41	27.4	30.6	24.4	82.5	22.2	SE	197	5.7	Ci.-S.	NE	Cu.	SW	☐ p.	
11.	59.27	28	31.4	24.8	82	22.2	SE	163.2	5	Ci.-S.	NE	Cu.-N.	E	☐ d ☐ a. ☐ p.	
12.	59.79	27.6	31.8	23.3	81.5	22.8	SE	182.2	3.7	A.-Cu.	S	Cu.		☐ p.	
13.	58.89	27.8	32.7	22.6	78.7	21.8	E quad.	164.2	2.2	Ci.-S.		Cu.-N.	E	☐ p.	
14.	58.27	27.6	32.6	22.4	77.2	21	SE, NE		2.3	Ci.-S.		Cu.	ENE	☐ a. ☐ p.	
15.	58.84	27.1	31.8	21.6	79	20.8	SE quad.		3.5	Ci.-S.		Cu.		☐ a. ☐ 2 p.	
16.	59.38	27.7	32.2	23.1	81.7	22.3	SE	171.1	4.5	Ci.-Cu.	SE	Cu.		☐ a. ☐ p.	
17.	59.94	28.2	32.8	23.3	77.2	21.7	Variable	135.2	5.5	Ci.-S.	S	Cu.-N.	NE	☐ a. ☐ p.	
18.	59.79	27.8	32.7	21.9	74.2	20.4	NW, S	150.7	7.7	A.-Cu.	E	Cu.-N.	ENE	☐ a. ☐ p.	
19.	59.49	27.1	31	23.4	82	21.7	E quad.	136.9	6	Ci.-S.		Cu.-N.	ENE	☐ a. ☐ p.	
20.	59.18	27	31.1	21.4	78.7	20.5	Variable	139.8	7	A.-Cu.	ESE	Cu.-N.	E	☐ a. ☐ p.	
21.	58.64	27.4	32.6	22.9	78.7	21.1	NE		9.3	Ci.-S.	SW by W	Cu.-N.	E	☐ a. ☐ p.	
22.	58.39	26.2	31.7	21.5	86.8	21.8	Variable		8.8	A.-Cu.	E by S	Cu.-N.	E	☐ a. ☐ p.	
23.	57.53	27.4	32.4	22.4	80.2	21.4	NE	146.2	8.8	Ci.-Cu.	SE by S	Cu.-N.	E	☐ a. ☐ p.	
24.	57.51	27	30.8	23.6	84	22.1	NE, E	152.8	5.2	A.-Cu.	SW	Cu.		☐ a. ☐ p.	
25.	58.92	27.2	31	23.5	81.5	21.6	S	131	5.3	Ci.-Cu.	NW	Cu.-N.	ESE	☐ a. ☐ p.	
26.	59.23	27.2	32.1	22.7	81.2	21.6	SE quad.	206.6	3.7	Ci.-S.		Cu.-N.	E	☐ a. ☐ p.	
27.	59	27.1	31.9	22.2	81.7	21.7	NE, S	160.1	5.2	A.-Cu.	E	Cu.-N.	ENE	☐ a. ☐ a. p.	
28.	58.14	27.2	32.7	21.7	77.7	20.5	SE quad.	223.4	6.8	Ci.-S.		Cu.	E	☐ a. ☐ p.	
29.	58.19	27.8	33.4	22.5	74	20	E quad.	198	8.2	A.-Cu.	E	Cu.-N.	E	☐ a. ☐ p.	
30.	58.70	27.8	33.8	21.9	74.7	20.5	NE	183.2		Ci.-S.		Cu.	E	☐ a. ☐ p.	
31.	58.70	26.8	32.8	23.1	79.3	20.6	NE, SE	163.4		A.-Cu.	E	Cu.-N.	E	☐ a. ☐ p.	
Mean	758.24	27.1	31.6	22.8	81.2	21.5		206.5	6.3						
Total														86.6	

TACLOBAN.

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82 \text{ mm.}$ ]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	Mean.	Maximum.	Minimum.	Prevailing direction.	Force (mean).			Amount (mean).	Form and its direction.						
									Upper.	Lower.					
1.	757.09	27.3	32.5	23.8	81.7	21.9	WNW, ESE	0-12.	0-10.	Ci.	WSW	Cu.	ENE	mm.	● $\overline{\text{I}}$ < p.
2.	757.19	26.2	31.5	24	88.2	22.3	NW	1.7	5.8	Ci.-S.	SW	Cu.-N.	ENE	2.3	● $\overline{\text{I}}$ p.
3.	58.10	25.3	26.7	24	92	22	NW	1.5	7.12	Ci.-S.		N.	NE	10.9	● a. p.
4.	56.28	25.8	29.4	24	87.2	21.5	NW quad.	2.8	8.8	Ci.-S.		N.	NNE	30.7	● a. p.
5.	48.19						WNW, SSE	7.2	10			N.	Variable	72.7	● $\overline{\text{I}}$ a. p.
6.	56.10	27.3	30.6	24.8	85.3	22.8	SSE	2	8.2	Ci.-Cu.	N	Cu.-N.	S	143.4	d a. ● $\overline{\text{I}}$ < p.
7.	58.11	27.1	30.5	24.5	85.2	22.6	SE quad.	1	6.5	Ci.-S.	N	Cu.	SE	2	● a. $\overline{\text{I}}$ a. p. < p.
8.	58.04	27.6	31	24.5	83.9	22.7	SSE	1.7	6.7	Ci.-S.	N	Cu.	ESE	1.5	● a.
9.	57.90	28.1	31.5	25	81.2	22.8	SSE	1.2	6.8	Ci.-S.	N	Cu.	SE	.5	● a. $\overline{\text{I}}$ a. p. < p.
10.	58.18	28.2	32	25	81.2	22.9	S, SSE	1	5.3	Ci.-S.	NE	Cu.	SSW, S		< p.
11.	59.20	28.5	32.4	24.3	80.3	22.3	SE quad.	1.2	3.8	Ci.-Cu.	ENE	Cu.	SSW		< a.
12.	59.88	28.3	31.5	26	80.7	22.3	SE	1.5	3.2	Ci.		Cu.	SE		$\overline{\text{I}}$ a. < p.
13.	59.14	28	31.5	24.6	81.7	22.7	SE	1.3	3			Cu.	SE		< p.
14.	58.38	28.4	32.4	25.7	78.3	22.3	SE	1.5	4.2	Ci.		Fr.-Cu.	SE	4.3	$\overline{\text{I}}$ a.
15.	58.76	28.3	32.3	25	78	22	SSE	1	2.3	Ci.		Fr.-Cu.	SE		< a.
16.	59.38	28.3	32.5	25.4	79.8	22.8	SSE	.8	4.5	Ci.-S.		Fr.-Cu.	SE		$\overline{\text{I}}$ a.
17.	60.02	28	32	24.3	79.7	22.2	SSE	.8	5.3	Ci.-S., Ci.-Cu.	N	Fr.-Cu.	SE	29.7	$\overline{\text{I}}$ a. $\overline{\text{I}}$ p.
18.	59.82	28.2	32.6	24.8	78.7	22.2	SE quad.	1.2	5.7	Ci.	N	Cu.	E	8.4	● $\overline{\text{I}}$ a. $\overline{\text{I}}$ p.
19.	59.54	27	30.5	24.4	84.8	22.8	E quad.	1	7.7	Ci.-S.	N	Cu.-N.	E	4.1	● a. p. $\overline{\text{I}}$ a. p.
20.	59.45	27	31.3	23.8	86.5	22.8	SE	.7	5.5	Ci.	N	Cu.	E	7.6	● a. $\overline{\text{I}}$ a. p.
21.	58.76	26.9	30.7	24.3	84.7	22.2	Variable	1.2	6.2	Ci.-S., Ci.	NNE	Cu.	E	1.8	● $\overline{\text{I}}$ a. $\overline{\text{I}}$ p.
22.	58.26	27.4	31.5	24.2	82.8	22.2	SE quad.	1	6.8	Ci.	N	Cu.-N.	E	4.3	● $\overline{\text{I}}$ a. $\overline{\text{I}}$ p.
23.	57.70	27.2	31.5	24.4	85.3	22.6	S, E	1	7.5	Ci.	N	Cu., Cu.-N.	E	1.3	$\overline{\text{I}}$ a. $\overline{\text{I}}$ p.
24.	57.72	27.4	30.5	24.8	82.7	22.3	SE quad.	1.7	8	Ci.-Cu.	NbyE	Cu.-N., Cu.	E	4.3	● $\overline{\text{I}}$ a. $\overline{\text{I}}$ p.
25.	58.80	27.2	30.5	24.7	85	22.7	S	.8	8.3	Ci., Ci.-Cu.		Cu.-N.	ESE	4.3	● $\overline{\text{I}}$ a.
26.	59.48	27.6	31.3	25	84.7	22.3	SSE	1	7.8	Ci.-S.	N	Cu.-N.	ESE		● $\overline{\text{I}}$ a.
27.	59.22	28.2	31.8	25	80.5	22.8	SE	1	4.8	Ci.-S.	N	Cu.	ESE		● a. p. < p.
28.	58.49	27.9	31.8	24	81	22.4	SE	1	3.2	Ci.-S.	NNE	Cu.	ESE	1.6	● a. p. < p.
29.	58.61	27.2	31.3	23.8	84.3	22.4	SE	1	5.2	Ci.-S.	NE	Cu.	S, ESE		$\overline{\text{I}}$ a.
30.	58.92	27.6	32	24.4	83.3	22.8	SSE	.8	5	Ci.		Cu.	ESE	13.4	● $\overline{\text{I}}$ p.
31.	59.18	26.3	30	23.5	87.7	22.2	E	1	8.8		N	Cu.-N.	SE, ESE	3.5	● a. ● p.
Mean	758.19	27.5	31.3	24.5	83.2	22.5		1.4	6.2						
Total														343.5	

## Meteorological data for first and second class stations—Continued.

## CAPIZ.

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied, -1.81 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.	Upper.	Lower.	
1.	757.51	27.4	33.3	25.4	82	22.2	ENE	0.8	5	Cl., Ci-S.	Fr.-N. ENE, E	☉ p.
2.	57.86	27	32.8	23.8	80.8	21.2	ENE	.5	5.7	Cl.	Cu.	☉ p.
3.	58.56	26.9	32.5	24.5	85	22.2	NE	.7	8.3	Cl.	Fr.-N. NE	☉ a. ● ☉ p.
4.	57.84	27.9	33.9	24.4	79.2	22	NE	.7	6.7	Cl.	Fr.-N. NE	☉ p.
5.	55.68	26.4	31.4	23.7	86.7	22.2	NNW	2.2	9.8	Cl.-S.	Fr.-N. NNW	☉ a. p.
6.	53.58	23.7	27	22.8	96.3	21	S quad.	2.3	10		N S quad.	☉ a. ● a. p.
7.	57.31	25.5	30.3	23.2	89	21.4	S	.5	9.7	Cl.-S.	Fr.-N. S	☉ d° a.
8.	57.50	27.3	35	23.1	83.2	22	N	.5	6.5	Cl.	Fr.-N. S	☉ p.
9.	57.28	27.2	34.7	24	85.7	22.8	SSE, N	.7	6.2	Cl.	Fr.-N. S, SW	☉ ☉ ☉ p.
10.	57.90	28.2	33.9	24.2	79.8	22.2	Variable	.5	5.5	Cl.-S.	Cu.-N. S, SSE	☉ ☉ ☉ p.
11.	58.88	28	34.3	25	84.2	23.6	S, NE	.3	2.8	Cl.	Fr.-Cu., Cu.-N. S	☉ ☉ ☉ p.
12.	59.33	28	34.9	24.3	83.3	23.2	ENE	.7	5.2	Cl.	Variable SE	☉ ☉ ☉ p.
13.	58.63	27.7	33.4	24.4	86.2	23.6	NE	.3	4	Cl.	Cu.-N. E	☉ a. ☉ p.
14.	57.83	27.9	33.5	23.4	85.2	23.6	N	.5	2.8	Cl.	Cu.-N. SE	☉ ☉ ☉ p.
15.	58.38	28	33.9	24.5	80.5	22.4	Variable	.5	4	Cl.	Fr.-Cu. SE	☉ ☉ ☉ p.
16.	59.09	27.3	34.3	23.4	82.3	22	N quad.	.5	3.8	Cl.	Cu., N. S, N	☉ ☉ ☉ p.
17.	59.33	27.5	34.2	23	81.5	22.2	NNW, ENE	.3	4.2	Cl., Ci.-S.	Cu.-N. N	☉ ☉ ☉ p.
18.	59.48	27.1	33.2	23.2	81.8	21.5	Variable	.7	6.7	Cl.	Cu.	☉ a. ☉ ☉ p.
19.	59.33	26.9	31.9	24.2	87.7	23.1	E quad.	.7	7.5	Cl.-S.	N. E	☉ a. ☉ ☉ p.
20.	59.04	27.1	32.5	23.6	83.3	21.8	ENE	.3	4.5	Cl.	Cu.	☉ a. p. ☉ p.
21.	58.47	28.1	32.9	25	80.8	22.6	E	.7	6.2		Cu.	☉ d° ☉ p.
22.	58.31	27.8	32.9	24.6	79.7	22	E	.5	8	Cl.	Cu.	☉ a. ☉ a. p. ☉ p.
23.	57.60	26.7	31.1	24	87.8	22.7	ENE	.5	7.5	Variable	Fr.-N. E	☉ ☉ a. p.
24.	57.59	26.3	31.6	23.7	89.5	22.8	ENE	.2	9.8	Cl.-S.	N. ENE	☉ ☉ a. ☉ ☉ p.
25.	58.76	26.1	30.3	23.6	88.3	22.1	N	.2	9.5	Cl.-S.	Fr.-N. E	☉ ☉ a. d° a. p.
26.	59.14	26.8	31	24.2	88	22.9	ESE	.2	8.5	Cl.	N. E	☉ ☉ a. ☉ p.
27.	58.85	27.2	32.9	24.6	86.5	23	E, ENE	.3	7.8	Cl.-S.	Fr.-N. E	☉ ☉ a. ☉ p.
28.	58.02	27.7	33.3	25.2	84.7	23.1	E, ENE	.7	4	Cl., Ci.-S.	Cu.-N. SE	☉ p.
29.	57.94	28.2	33.2	25.5	81	22.6	ENE	.8	2.8	Cl.	Cu.	☉ p.
30.	58.52	27.9	33.2	25.4	82.8	23	NE quad.	.8	5.5	Cl.	Cu.	☉ p.
31.	58.80	28.5	33.3	25.3	78.2	22.4	ENE, NE	1.2	5.7	Cl.	Cu.	☉ ☉ ☉ p.
Mean	758.16	27.2	32.8	24.2	84.2	22.4		.7	6.3			
Total												183

## CALBAYOG.

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied, -1.80 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	757.15	26.9	33.6	22.1	81.8	21.3	N quad.	141	3.7	Cl.-S.	Cu.-N. NE	☉ a.
2.	57.34	26.1	32.9	22	85	21.1	N quad.	131.6	4.7	Cl.-S.	Cu.-N. NNE	☉ ☉ a. ☉ ☉ p.
3.	58.22	24.8	28.8	23.2	93.3	21.6	NNE	83	7.3	Cl.-S.	Cu.-N. NE	☉ a. ☉ ☉ p.
4.	56.67	25.5	29.7	22.7	89.3	21.6	NNW	151	5.8	Cl.-S.	Cu.-N. NNE	☉ a. p. ☉ p.
5.	50.11	24	25	23.17	*91.5	*20.5	N quad.	697.2	10		N. NE quad.	☉ a. ☉ ☉ p.
6.	55.61	25.6	29	23.8	*90	*22.3	E quad.	258.5	8.3	Cl.-S.	N. SSE	☉ a. ☉ ☉ p.
7.	57.88	25.8	29.9	22.5	88.3	21.6	SE, S	135.3	3	Cl.	Cu.-N. S	☉ a. ☉ ☉ p.
8.	57.91	26.7	31	22.7	86	22.2	SSE, SSW	109.3	5.2	Cl.-S.	Cu.-N. S	☉ a. ☉ ☉ p.
9.	57.53	27.6	30.5	24	80.8	22.2	ESE, WSW	123.5	3.3	Cl.	Cu.	☉ p.
10.	57.94	27.8	31	24.9	82.8	22.9	SSE	146.3	3	Cl.-S.	Cu.-N. S	☉ p.
11.	58.83	27.8	31.8	24.6	83	22.9	SE, SW	114.9	3.5	Cl.	Cu.-N. S	☉ a. ☉ ☉ p.
12.	59.59	28.5	32.5	25.2	80.7	23.2	Variable	135.8	1.5	Cl., Ci.-S.	Cu.	☉ a. ☉ ☉ p.
13.	58.73	28.2	32	23	79.7	22.4	Variable	127.6	1.5	Cl.	Cu.	☉ a. ☉ ☉ p.
14.	58.06	28.6	32.8	24	77.8	22.4	Variable	137.7	1.8	Cl.	Cu.-N.	☉ a. ☉ ☉ p.
15.	58.65	27.6	32	23.1	78.8	21.4	Variable	133.8	0	Cl.	Cu.	☉ p.
16.	59.27	27.7	32.5	22.5	80.8	22	E quad.	149.8	1.2	Cl.	Cu.	☉ a. ☉ ☉ p.
17.	59.80	26.8	32	22.7	82.7	21.5	E	169.7	2.5	Cl.	Cu.	☉ a. ☉ ☉ p.
18.	59.86	26.3	32	22.1	86.3	21.8	ENE, N	141.6	3.7	Cl.	Variable	☉ a. ☉ ☉ p.
19.	59.46	26.7	33	23.8	86.8	22.6	NE, NNE	115.1	5.5	A.-Cu., Ci.-S.	Cu.-N., S.-Cu.	☉ a. ☉ ☉ p.
20.	59.32	25.4	30.9	22.5	89.8	21.5	N	140.9	3.2	Cl.	Cu.	☉ a. ☉ ☉ p.
21.	58.59	26.3	30.3	23.2	85.8	21.7	Variable	130.7	3.8	Cl.-S.	Cu.	☉ a. ☉ ☉ p.
22.	58.18	26.5	31.6	23.5	85.3	21.6	Variable	137.4	5	Cl.-S.	Cu.-N. E	☉ a. ☉ ☉ p.
23.	67.47	26.9	31.7	23.4	83.5	21.8	Variable	126.4	5.8	Cl.-S.	Cu.	☉ a. ☉ ☉ p.
24.	57.54	26.1	31.2	23.9	88.2	22	N	143	7	Cl.-S.	Cu.-N. ESE	☉ a. p. ☉ ☉ p.
25.	58.78	26.8	31.5	23	82.2	21.3	Variable	125.6	8.2	Cl.-S.	S.-Cu.	☉ a. ☉ ☉ p.
26.	59.28	26.8	31.2	23.6	84.8	22	N	133.8	6.7	Cl.-S.	Cu.-N. ESE	☉ a. ☉ ☉ p.
27.	58.94	27	31.4	22.9	82.5	21.6	N	140.6	4.7	Cl.-S.	Cu. E by S	☉ a. ☉ ☉ p.
28.	58.29	26.4	32.5	22.7	85.2	21.6	N	140.6	4.2	Cl.-S.	Cu.-N. ESE	☉ a. ☉ a. p. ☉ p.
29.	58.41	25.8	31.3	22.3	87.8	21.4	N	122.8	2.8	Cl.-S.	Cu.-N. E	☉ a. ☉ ☉ p.
30.	58.70	26.7	32.6	22.6	84.8	21.8	S	133.8	2.8	Cl.	Cu.	☉ a. ☉ ☉ p.
31.	58.82	27	35.5	23.4	83.5	21.8	NE quad.	174.5	5.3	Cl.-S.	S by E	☉ a. ☉ ☉ p.
Mean	758.09	26.7	31.4	23.2	84.8	21.9		156.5	4.4			
Total								4,852.8				207

a Deduced from 4 observations only.

b Deduced from 5 observations only.

## Meteorological data for first and second class stations—Continued.

## LEGASPI.

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied, -1.77 mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Form and its direction.	Upper.		Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	757.59	27.9	31.9	24.1	78	21.6	NE	210.9	6.5	Ci.-S.	Cu.	E		● p.
2.	57.70	27.7	33.4	23.2	78.2	21.4	NNE	271.8	5.8	Ci.-S.	Cu.	E	49.3	● 2 a. ● p.
3.	58.70	25.7	27.5	22.5	87.3	21.3	NNE, NE	200.8	9.3	Ci.-S.	N.		28.2	● p.
4.	57.43	27.8	31.5	24.1	78.7	21.8	NNE	346.7	5.8	Ci.-S.	Cu.-N.	ENE	43.5	● 2 a. p.
5.	55.38	25.6	27.4	21.9	87.3	21.3	NNE	525.1	9.8	Ci.-S.	Fr.-N.	NE	97.7	● 2 a. ● a. p. < p.
6.	55.26	26	26.8	23.2	89.7	22.5	E	519.7	9.7	Ci.-S.	Fr.-N.	SE	14.5	● a.
7.	57.65	27	31.6	22.5	84.8	22.2	NE, S	94.4	7.5	Ci.-S.	Cu.	S	.8	
8.	57.70	27.4	32.5	22.1	85	22.8	E	111	7.2	Ci.-S.	Cu.	SW, SSW		
9.	57.24	28	33.1	23	80.3	22.3	SW quad.	196	6	Ci.-S.	Cu.	SW		
10.	57.39	27.8	32.8	23.6	79.7	22	SW	222	4.5	Ci.	Cu.	SW quad.		
11.	58.60	28.4	34.4	23.5	78.7	22.3	SW	181.7	2.7	Ci.	Cu.	WSW, SW	d° a.	
12.	59.29	28.3	33.4	22	82	23.3	E	139.3	3	Ci.	Cu.	S		
13.	58.62	28.6	34.1	22.5	81.5	23.4	Variable	122	1.8	Ci.	Fr.-Cu.	SE		
14.	57.91	28.8	34.8	22.5	77.3	22.3	S quad.	103.8	2.2	Ci.	Cu.	SE, SSE	T p.	
15.	58.25	28.5	34.5	23.4	79.3	22.5	S quad.	140.4	2.2	Ci.	Cu.	SE, SW		
16.	58.95	28.8	34.8	22.6	76.8	22	S, SSW	129.5	1.7	Ci.	Cu.	SW, WSW		
17.	59.62	28.4	35	21.7	78.2	22.3	SSE, E	126.8	2.7	Ci., Ci.-S.	N.	S		
18.	59.99	28.8	33.2	24.1	77	22.5	NE	204.3	3	Ci.	Cu.	ENE	1	
19.	59.83	28.2	32.2	24.4	80.7	22.9	NE	214.4	5.8	Ci.-S.	Cu.-N.	E	25.1	● a. ● a. p.
20.	59.55	28	32.5	23.5	78.8	21.8	NE	200.9	4.2	Ci.	Cu.	ENE	1	● a. ● p.
21.	59.02	28.6	32.8	24	76.7	22	NE	254.5	3	Ci.-S., A.-Cu.	Cu.-N.	ENE, E	1.5	● a. < ● p.
22.	58.52	27.6	31.4	24	82	22.5	NNE	203.3	5.2	Ci.-S.	Cu.	ENE, E	11.5	● d° a.
23.	57.89	28	32.8	24	80	22.4	NNE	207.8	6.5	Ci.-S.	Cu.-N.	E	3.1	● a. ● p.
24.	57.74	27.4	30.5	23.9	82.7	22.4	NE	188.3	6.8	Ci.-S.	Cu.-N.	ENE	1.3	● a. ● p. < p.
25.	58.96	28.2	32.4	25	80.2	22.7	NE, E	182.4	8.2	Ci.-S.	Cu.	E		
26.	59.30	28.8	33	25.1	79	23.2	NE, ENE	210.1	5.2	A.-Cu., Ci.-Cu. W	Cu.	S		
27.	59.20	29.2	33.4	25.4	76.7	22.9	NE	218.4	3	Ci.	Cu., Cu.-N.	ENE	1	● < p.
28.	58.52	28.7	32.9	24.3	77.5	22.5	NE	217.4	1.7	Ci.	Cu.	E		● p.
29.	58.59	29	33.3	24.6	73.8	21.8	NE	225.7	1.5	Ci.-S.	Cu.	ENE	24.1	● p.
30.	59.14	28.7	33	22.6	78.3	22.8	NE	203.6	3.3	Ci.-S.	Cu.		.6	● a. < ● p.
31.	59.18	29	32.8	24.4	77.8	23.1	NE	259.1	5.5	Ci.-S.	Cu.	E	10.4	● a. < ● p.
Mean	758.35	28	32.4	23.5	80.1	22.3		213.9	4.9					
Total								6,632.1					314.6	

## ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humid-ity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours be-ginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	757.46	28.2	31.9	26.4	75.8	21.5	NE, N	296.3	4.7	Ci.	W	Cu.	NE	
2.	57.96	28.5	31.7	25.4	75.7	21.7	NE	400	6.3	Ci.	SSW	S.-Cu.	NE, ENE	0.8
3.	58.94	26.6	29.5	24.6	85.3	22	NE quad.	441.1	7.2	A.-Cu.	E	N.	NE	6.5
4.	58.19	27.7	30.7	25.5	82	22.6	NE	583	5.8	A.-Cu.		S.-Cu.	NE	23.5
5.	57.03	27.7	30.5	25.2	80	22	NE quad.	670.7	8.7	A.-Cu.	NE, ENE	S.-Cu.	NE	8.5
6.	55.32	26.9	28	25.2	85	22.3	NE	976.3	10	Ci.-S.		N.	E	3.6
7.	56.67	26	28	24.4	85.5	21.4	SE	266.1	10	Ci.-S.		N.	SSE	
8.	56.81	27.2	30.9	24.9	83.3	22.2	S	235.9	9.8	Ci.-S.		S.-Cu.	S	
9.	56.44	27.2	30	25.9	82.2	22	S quad.	297.9	10	Ci.-S.	WNW	S.-Cu.	S, SSW	d° p.
10.	56.93	27.8	31.6	24.5	78.3	21.6	S, SW	241.9	9.3	Ci.-S.		S.-Cu.	SW	
11.	58.06	28.1	32.9	24.4	79.2	22.2	SW	203.4	6	Ci.-S.	NE	S.-Cu.	SSW, SW	○ a. p. ⊙ p.
12.	58.99	28	33.2	23.8	80.8	22.4	SW	178.4	3.2	Ci.		Cu.	S	⊙ p.
13.	58.38	28.4	33.8	24.8	78.2	22.2	SW	245.5	3	Ci.		Cu.	S, SSW	⊙ p.
14.	57.52	28.5	34.1	24.8	76.5	21.6	SW	271.3	2	Ci.		Cu.	S	⊙ p.
15.	57.81	28.3	33.4	24	78.3	21.8	SW	278.6	1.8	Ci.		Cu.	SW	⊙ p.
16.	58.62	28.2	33.9	24.1	77.3	21.6	SW	245.7	2.5	Ci.		Cu.	SW, W	⊙ p.
17.	59.49	27.9	32.3	22.6	80.2	22.2	SW	242.2	3.8	Ci.-S.	SE	Cu.		34.3
18.	59.74	26.2	31	22.8	89.2	22.4	SW	220.3	5.5	Ci.		Cu.	SE	7.9
19.	59.63	27.4	31.6	23.4	84	22.6	NE	240.2	5	Ci.		Cu.	NE	
20.	59.12	27.6	33	24.4	83.3	23.2	Variable	190.3	4.8	Ci.		Cu.	NE, E	9.4
21.	58.82	28.1	31.8	24	77.7	21.7	NE	337.1	1.8	Ci.		Cu.	E	
22.	58.85	27.8	30.8	25	80.7	22.2	NE	381.5	8	Ci.-S.		S.-Cu.	NE	3.1
23.	57.75	28.2	31.6	25.2	81	23	NE, N	290.8	9.2	Ci.-S.		S.-Cu.	NE	
24.	57.56	28.1	31.4	24.7	80.2	22.5	NE	189.6	9.7	Ci.-S.	E	Cu.	E	8
25.	58.52	27.3	32	24.5	85.5	22.8	S	166.7	9.3	A.-Cu.		S.-Cu.	SE	3.3
26.	59.30	26.2	31.7	23.6	89.5	22.3	SW	216	8.2	A.-Cu.	WSW	S.-Cu.	SE	14.1
27.	59.02	27	30.5	23.4	85.7	22.6	SW	186.4	8.2	Ci.-S.		S.-Cu.	E	
28.	58.17	26.6	33	23.8	85.5	22.3	SW, W	193.9	5	Ci.	NE	Cu.	E	9.6
29.	57.98	27.6	32.3	23	82.7	22.5	SW, N	236.6	4.2	Ci.-S.	E	Cu.	E quad.	1.3
30.	58.90	28.2	31.4	22.1	82.2	23.2	NE	299.8	3.8	Ci.		Cu.	E, SE	
31.	59.06	28.8	31.9	26.3	78.3	23	NE	377.6	7.5	Ci.		S.-Cu., Cu.	ENE	
Mean	758.16	27.6	31.6	24.5	81.6	22.2		309.7	6.3					
Total								9,601.1						133.5

## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5<sup>a</sup> meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.	Upper.	Lower.	mm.		
1.	756.79	28.5	35.1	23.6	68.7	19.5	NE quad.	1.2	5.5	Cl.-S.	SW	Cu. E		
2.	57.37	28.4	34.1	23.4	68.3	19.4	NE	1.8	5.8	Cl.-S.		Cu. E		
3.	58.78	25.3	30.3	23.6	86.3	20.6	NE	1.7	7.8	Cl.-S.	NW	N. ENE, NE	15.1	
4.	57.84	27.7	32.5	22.5	76	19.9	NE	1.7	6.5	Cl.-S.		S.-Cu. E, ENE		
5.	56.81	27.7	33.2	24	73.8	20	NE	2.3	6.8	Cl.-S.		Cu. E		
6.	55.03	25.8	29.4	24.9	84.7	20.9	NE	2.5	9	Cl.-S.		N. ENE	26.2	
7.	55.29	26.2	27.4	24	82.2	20.9	E, SE	3.2	10	Cl.-S.		N. SE, SSE		
8.	56.18	27.1	30.1	24.3	83	22	SE	1.8	9.2	Cl.-S.		N. SW, SSW	11.4	
9.	56.32	26.4	28.6	23.7	86.3	21.9	SW	1.8	9.5	Cl.-S.		N. WSW	6.4	
10.	56.93	27.5	32	25.2	80.5	22	SW	2.5	8.3	Cl.-S.	ESE, S	Cu. SW		
11.	58.02	27.5	32.6	23.9	83.2	22.5	SW	1.2	6	Cl.-S.		Cu., S.-Cu. SE, W		
12.	58.83	28.4	34.5	22.9	77.7	22.1	SW	.8	4.5	Cl.-S.	NW	Cu. SE		
13.	58.23	28.3	34	23.7	78.7	22.3	NE, S	1.2	4.2	Cl.		Cu. SE		
14.	57.47	28.1	33.2	22.5	76.3	21.4	Variable	1	4.3	Cl., Cl.-S.		Cu. SE		
15.	57.84	28	35	23	78	21.5	S	.7	5	Cl.-S.	E	Cu.-N. S		
16.	58.73	27.8	34.7	23.1	79.3	21.8	NE	1.3	4.7	Cl.-S.	NE	Cu. SSE		
17.	59.36	28.1	34.9	23	76.7	21.2	NE, SW	1	5.5	Cl.-S.	NNE	Cu.-N. SE		
18.	58.98	28.3	36.5	23.7	75.8	21.1	ESE	.5	4.8	Cl.-S.		Cu. SE		
19.	59.22	28.5	34.9	24.3	73.8	20.8	Variable	1	4.3	Cl., Cl.-S.		Cu. E		
20.	58.72	28.2	33.6	23.7	76.7	21.5	NE	1.2	6.2	Cl., Cl.-S. ESE, E		Cu. SE		
21.	58.62	28.4	33.6	22.4	74	21	NE	1.2	5.5	Cl.		Cu. E, SE		
22.	58.14	28.2	34.2	21.9	69.8	19.5	NE	1.5	5.7	Cl., Cl.-S.		Cu. E		
23.	57.32	28.4	33.4	24	74.3	21.2	NE	1.3	8	Cl.-S.		S.-Cu., Cu. E		
24.	57.06	29.1	36	24.4	69.7	20.3	SW	.8	8	Cl.-S.		Cu.-N. E		
25.	58.26	28.8	33.2	24	73.5	21.5	Variable	.7	8.3	Cl.-S.	NW	S.-Cu. E		
26.	58.94	26.1	32.5	22.5	85.3	21.3	NE quad.	1	9.2	Cl.-S.	SE	N. E, ESE	108	
27.	58.87	26.1	33.6	23.5	88.3	21.3	NE	.8	8.7	Cl.-S.	NNE	S.-Cu. SE	17.5	
28.	57.79	27.8	33.8	23	76.8	20.8	SE	1	7	Cl.-S.	ENE	Cu., S.-Cu. SE		
29.	57.60	28.3	33.2	23.1	76.5	21.1	E quad.	1	5.7	Cl.-S.		Cu., S.-Cu. SE		
30.	58.50	28.8	34	24	72.2	20.8	NE quad.	1.3	5.8	Cl.-S.	NE	Cu. SE		
31.	58.60	28.7	33.5	25	71.5	20.7	NE	1.8	7	Cl.-S.	E	Cu. SE		
Mean	757.82	27.7	33.1	23.6	77.4	21.1		1.4	6.7					
Total													184.6	

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	757.98	27.3	31.8	23	83	22.2	NE	176.4	3.5	Cl.	Cu. E	
2.	58.32	27.7	32.2	24.1	80.3	22	ENE	241.6	5.5	Cl.	Cu. E	
3.	59.30	26.9	29.2	24	86.8	22.7	ENE	269.6	9	Cl.-S.	Cu. ENE	15.5
4.	58.42	27.6	31.5	24.6	82.5	22.6	ENE	359.5	6.8	Cl.	Cu. ENE	11.1
5.	57.40	27	31.5	25.2	85	22.4	NE	460.2	8.7	Cl.-S.	Cu. E	
6.	55.96	26.5	27.7	24.8	88.2	22.7	ENE	572.6	10	Cl.-S.	S.-Cu. ENE	5.3
7.	57.26	27.1	31.4	24.4	84.7	22.2	E	133.6	10	Cl.-S.	Cu. SE	4.6
8.	57.26	26.8	31.6	23.7	84.8	22.8	E, SW	80.9	10	Cl.-S.	Cu. SE	10.2
9.	56.52	27	32	23.3	83.3	21.8	SW	163.5	10	Cl.-S.	Cu. S	
10.	56.96	28.1	33	25	84	23.6	SW, WSW	167.3	8.7	Cl.-S.	Cu. S	
11.	58.08	28.8	34.1	24.2	78	22.6	SW	193.4	4.2	Cl., Cl.-S.	Cu. SW	
12.	59.26	28.4	34	24.3	84.7	24.1	SW	129.1	3.7	Cl.	Cu. S	
13.	58.53	28.3	33.3	24.1	85.2	24.2	NE	125.3	2.7	Cl.	Cu. SW	
14.	57.64	27.4	34.4	24.5	87	23.4	NE	128.7	1.5	Cl.	Cu. SW	
15.	58.05	29	33.2	23.8	88.7	23.3	NE, SSW	110.1	2.7	Cl.	Cu. SSW	14.8
16.	58.82	29	34.1	25	82.3	24.2	SW	150.8	1.5	Cl.	Cu. SW	
17.	59.86	27.1	33.1	24.5	89.7	23.7	Calm	111.3	5.2	Cl.	Cu. W	
18.	60.03	28.2	33.8	24	82.2	23	E	168.5	6.3	Cl.	Cu. E	
19.	59.94	28.3	33	24.5	82.8	23.5	E	200.6	6.2	Cl.	Cu. E	
20.	59.61	29	33	25.1	80	23.5	NE	199	8.3	Cl.	Cu. E	
21.	59.20	28.6	33.1	24.3	75.7	21.8	NE	228.2	3	Cl.	Cu. E	
22.	58.98	26.5	31	23.8	89.2	22.9	NE	154.1	8.2	Cl., Cl.-S.	Cu. E	
23.	58.13	27.8	31.6	24.3	84	23.1	E	169.2	9	Cl.-S.	Cu. E	
24.	57.98	27.4	32.1	24.8	86.2	23.1	E	122.8	8.3	Cl.-S.	Cu. E	
25.	59.04	26.9	32	24.1	86.8	22.7	E	115.5	7.7	Cl.-S.	Cu. E	
26.	59.55	26.6	32.2	24	88.7	22.7	E	124.2	7.3	Cl., Cl.-S.	Cu. E	
27.	59.28	27.7	32.3	23.4	83.2	22.6	E	117.8	2	Cl.	Cu. E	
28.	58.44	27.8	32.2	23.1	81.7	22.3	E	153.6	2	Cl.	Cu. E	
29.	58.55	28.1	32.3	23.5	80.3	22.3	ENE	172.3	.8	Cl.	Cu. E	
30.	59.45	28	32.6	23.1	78.7	21.9	ENE	212.9	1.8	Cl.	Cu. E	
31.	59.53	28.2	32.8	24.1	81.8	23.2	E	262.9	7.3	Cl.-S.	Cu. ENE	
Mean	758.49	27.6	32.3	24.1	83.9	22.8		192.7	5.8			
Total								5,973.5				135.7

\* This is an approximate height of the barometer above sea level.

*Meteorological data for first and second class stations—Continued.*

SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied,  $-1.69$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
	mm.	°C.	°C.	°C.	P. et.			mm.	Prevailing direction.		Force (mean).	Form and its direction.			Upper.	Lower.
1.	757.54	29.7	36	24.4	63.5	19	NE	0-12.	0-10.				mm.	☉ ≡ a. < p.		
2.	57.96	28.9	34.4	23.2	66	19	NE	2.7	4.5	Cl.		Cu.	E	☉ ≡ a. < p.		
3.	59.02	28.7	35.9	22.2	68.8	19.5	NE	2.5	4.3	Cl.		Cu.	E	☉ ≡ a. < p.		
4.	58.25	29.3	36.5	23.2	66.7	19.6	NE	2.2	4.7	Cl.		Cu.	E	☉ ≡ a. < p.		
5.	57.45	28.8	35.6	22.9	70.5	20	Variable	2.2	4.5	A.-Cu.	SE	Cu.	E	☉ ≡ a. < p.		
6.	56.87	26.1	31.2	23.8	83.8	21	NE, NW	2.7	4.8	Cl.-S.	SE	Cu.	E	☉ ≡ a. < p.		
7.	56.51	25.9	28.7	23.8	91.2	22.6	NE, E	3	9.8	Cl.-S.		Cu.-N.	E	13 ☉ ≡ a. d. ● p.		
8.	56.42	25.7	31.4	22.8	91.7	22.4	S	2.2	10	Cl.-S.		Cu.-N.	SE	2.3 ☉ ≡ a. p. ●		
9.	56.37	25.1	27.1	24	96.8	23	S quad.	3	10	Cl.-S.		Cu.-N.	S	16 ☉ ≡ a. d. p.		
10.	57.12	26.6	31.9	24	94.2	24.5	S quad.	2.5	8.8	Cl.-S.		N.	SW	12.5 ☉ ≡ a. p. ●		
11.	58.46	27.7	32.8	24	87	23.8	SW	2.7	7	Cl.		N.	SW	3.6 ☉ ≡ a. d. ● p.		
12.	59.22	28.6	34.7	23.5	79.7	22.6	SSW	2.3	4.3	Cl.		Cu.-N.	SW	☉ ≡ a. < p.		
13.	58.66	29.1	35.1	22.5	77.3	22.7	SSW	2	4	Ci.		Cu.	SW	☉ ≡ a. < p.		
14.	57.90	29.4	35.2	23.7	78.2	23.4	NW	2	4	Ci.		Cu.	SW	☉ ≡ a. < p.		
15.	58.20	29.3	35.9	24.2	76.8	22.7	SW, S	2	4	Ci.		Cu.	SW	☉ ≡ a. < p.		
16.	59.27	27.6	35.7	22.9	83.7	22.1	SW	1.5	4	Ci.		Cu.-N.	SW	☉ ≡ a. < p.		
17.	59.83	27.1	34.9	22.5	83.8	22.1	N	1.8	6	Ci.		Cu.-N.	NE	16.8 ☉ ≡ a. ☐ ● < p.		
18.	59.87	27.2	35.4	22.8	84.2	22.1	Variable	2.5	5.3	Ci.		Cu.-N.	ESE	☉ ≡ a. ☐ ☐ < p.		
19.	59.60	28.8	35	22.8	73.7	21	E	1.7	3.5	A.-Cu.		Cu.	E, ESE	☉ ≡ a. ☐ ☐ < p.		
20.	59.48	28	35	23	77.8	21.4	NNE	1.5	3.7	A.-Cu.	SE	Cu.	E	☉ ≡ a. ☐ p.		
21.	59.11	28.2	34.6	22.6	73.3	20.2	ESE	2.2	4.7	A.-Cu.	SE	Cu.	E	☉ ≡ a. ☐ p.		
22.	58.79	28.7	36	21.4	69.2	19.6	E	2.7	3.7	Ci.	ENE	Cu.	E	☉ ≡ a. ☐ < p.		
23.	58.10	27.9	34.5	23.3	79.5	21.7	N	2.5	7	A.-Cu.	ESE	Cu.-N.	E	3 ☉ ≡ a. ☐ < p.		
24.	57.64	28.6	36	22.8	74.8	21.2	N, NE	2	5.2	Ci.	NE	Cu.-N.	E	☉ ≡ a. ☐ < p.		
25.	58.68	27.2	34.9	23.3	84	22.3	E	1.3	5.3	Ci.		Cu.	E	2.3 ☉ ≡ a. d. ☐ < p.		
26.	59.33	27.7	35.5	23	81.7	21.8	N	2.3	5.8	Ci.		Cu.-N.	E	5.1 ☉ ≡ a. ☐ ☐ < p.		
27.	59.59	25.8	33.6	22.7	89.3	21.8	N	2	8.8	A.-Cu.	ESE, SE	Cu.-N.	E, ESE	12 ☉ ≡ a. ● ☐ < p.		
28.	58.37	27.1	34	22.3	82	21.5	SE	1.8	5.2	Ci.		Cu.	E, N	☉ ≡ a. ☐ < p.		
29.	58.16	28.5	34.8	23	78	21.9	E	2.3	3.3	Ci.		Cu.	E quad.	☉ ≡ a. ☐ < p.		
30.	59.15	28.8	35	22.5	70.7	19.9	E	2.8	2.2	Ci.	NE	Cu.	E	☉ ≡ a. ☐ < p.		
31.	59.30	28.3	34.7	22.1	73.7	20.3	E	3	4.3	Ci.	NE	Cu.	E	1 ☉ ≡ a.		
Mean	758.39	27.9	34.3	23.1	79.1	21.5		2.3	5.5							
Total														84.9		

DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied,  $-1.67$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C	°C	P. ct.	mm.	Km.	0-10.				mm.	
1	756.77	28.6	35.3	24.1	71.2	20.4	NW, SE	258.9	3.7	A.-Cu.		Cu.	0 a. 1/4 p.
2	57.20	28.5	37.3	23.6	74.2	20.9	S quad.	250.4	4.7	A.-Cu.		S.-Cu., Cu.	4.1 d 1/4 0 p.
3	58.27	28.5	35	23.5	72.2	20.4	SE	218.7	3.7	Ci.		S.-Cu.	< d p.
4	57.58	28.6	35.2	23.5	73.2	20.7	SE, NW	238.3	2.8	Ci.		Cu.	.3 1/4 0 p.
5	56.70	28.8	36.5	23.6	73.2	21	SE, NW	215.1	5.2	Ci., A.-Cu.		S.-Cu.	< 0 p.
6	56.32	28.2	33.3	24.5	75.8	21.5	Variable	159.1	8.3	A.-Cu.		Fr.-N.	E d 0 a. p. 0 p.
7	55.35	28.6	35.4	24.5	68	19.6	SE	337.3	9.7	A.-Cu.	ESE	S.-Cu.	E d a.
8	54.91	26.4	30.8	24.5	81	20.7	SE	434.5	10	A.-S.		Fr.-N.	SSE 29.7 0 p.
9	54.87	24.9	26.7	23.8	92.5	21	SE	332.2	10			N.	S quad. 17.5 0 a. p.
10	56.58	26.3	31.1	23	88.8	22.6	Variable	157.6	8.5	A.-Cu.	W	Fr.-N. sw, wsw	5.4 0 a. 0 p.
11	57.61	27.7	33.9	24.5	84.5	23.1	W	152.2	7.8	A.-Cu.		Fr.-N.	34.5 0 2 1/4 p.
12	58.42	28.6	35.3	24	78.2	22.6	SE	190.1	5.5	Ci., A.-Cu.		Cu.	d 0 p.
13	58.10	28.6	33.7	24.1	77.7	22.3	NW quad.	206.5	.7	Ci.		Cu.	< 0 p.
14	57.32	28.4	33.3	23.6	79.2	22.6	NW, NNW	192.3	.8	Ci.		Cu.	0 a. < p.
15	57.65	28.6	34.3	23.5	76	21.8	NW	199.3	.7	Ci.		Cu.	0 a. < p.
16	58.69	29.1	33.4	24.8	75.7	22.3	NW	265.3	3.2	A.-Cu.	S	Cu.	0 a.
17	59.20	28.4	34.1	23.5	78.5	22.2	NW	214.9	4.8	Ci.		S.-Cu., Cu.	4.4 0 1/4 p.
18	59.18	28.1	36.5	22.5	76.5	21	S quad.		4.8	A.-Cu.		S.-Cu.	.5 0 0 p.
19	58.84	29	37.2	23	72.3	21	SE	238.3	4.5	Ci.		Cu.	
20	58.86	28.7	37	23.5	74.7	21.2	SE quad.	180	5.8	Variable		Cu.	1 1/4 0 0 0 p.
21	58.30	28.4	35.8	22.6	75.8	21.6	SE, NW	232.3	5.5	Ci., Ci.-S.		Cu.	1 p.
22	57.88	28.9	36.6	23.5	72.2	21.1	Variable	216.5	1.8	Ci.		Cu.	< p.
23	57.35	27.8	36.7	23	77.2	21	S quad.	203.3	6.7	Ci.		Cu.-N.	E 42.4 1/4 0 2 d p.
24	57	28.2	36.5	23.1	78.3	21.6	Variable	202	6.8	Ci.-S.	SW	Cu.	3 1/4 p.
25	57.94	28.3	37.2	23.5	78.8	21.9	SE quad.	190.3	4	Ci.		Cu.	3 1/4 0 0 p.
26	58.84	27.6	35	23.5	82.3	22.1	SE	208.1	7	Ci.-S.		Cu.	32.8 1/4 0 2 p.
27	58.91	26.3	34.3	21.6	85.7	21.5	SE	165.9	8	A.-Cu.		S.-Cu.	80.5 1/4 0 2 d p.
28	57.52	27.4	35.5	22.4	81.8	21.9	SE	203	5.8	Ci., Ci.-S.		Cu.-N.	73.2 1/4 0 1/4 p.
29	57.44	28.5	36.1	23	78.8	22.2	SE	236.8	4.2	Ci.		Cu.	1/4 0 2 p.
30	58.42	29.4	36.3	24.5	76.7	23	Variable	195.1	4.2	Ci.		Cu.	< p.
31	58.32	29.4	37	23.5	70.7	21.1	SE quad.	217.7	5.3	Ci.-S.	SE	Cu.	
Mean	757.62	28.2	34.9	23.5	77.5	21.6		223.7	5.3				
Total													329.3



## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.				Upper.	Lower.	
1.	757	29.8	34	25.6	69	21.1	N quad.	3.5	0-12.	A.-Cu., Ci.-S.	Cu.	mm. 13.7
2.	57.44	28.9	32.9	24.6	73.3	21.2	S, WNW	3	4.8	Ci.-S.	S.-Cu., Cu.	● □ a. < a. p. d p.
3.	58.39	29.4	34	24.5	69.7	20.7	SSE, NW	2.7	5.5	Ci.-S.	S.-Cu., Cu.	□ d p.
4.	57.73	29.4	34.2	24.9	71.7	21.5	SSE, WNW	3.2	4.3	Ci.-S.	Cu.	□ d p.
5.	56.82	29.4	35.5	25.5	71.2	21	SSE, NW	2.8	7.3	Ci.-S.	Cu.	□ d p.
6.	56.47	28.4	33.3	24.4	80.8	23	S, NNE	2	10	Ci.-S.	S.-Cu.	□ d p.
7.	55.34	29.4	34.1	25.7	69.5	20.7	SE quad.	3.7	10	Ci.-S.	S.-Cu.	□ d p.
8.	54.48	26.8	29.2	24.9	81.7	21.2	SE	5.7	10	Ci.-S.	S.-Cu.	□ d p.
9.	53.87	24.7	25.7	23.1	93	21.6	SSW	5.3	10	Ci.-S.	N.	□ d p.
10.	56.52	26.7	29.9	24	88.7	23	SSE, W	2.8	10	Ci.-S.	Cu.	□ d p.
11.	57.67	27.3	31.1	24.9	84	22.4	SSE	3.2	10	Ci.-S.	S.-Cu.	□ d p.
12.	58.50	28.3	32.9	24.9	78	22	SSE	2.7	8.7	Ci.-S.	Cu.	□ d p.
13.	58.16	28.2	33.5	24.1	76.2	21.3	SSE	2.7	6.3	Ci.-S.	Cu.	□ d p.
14.	57.60	27.8	32.4	24.9	81.3	22.4	W quad.	2.5	8.5	Ci.-S., Ci.	Cu.	□ d p.
15.	57.80	28	32.9	24	76.3	21	S quad.	2.3	10	Ci.-S.	Cu.	□ d p.
16.	58.99	27.8	31.9	24.1	82	22.5	W	2.7	8	Ci.-S.	Cu.	□ d p.
17.	59.39	28.5	33	23.9	78.2	22.5	NW quad.	2.7	8.8	Ci.-S.	Cu.	□ d p.
18.	59.36	28.7	33.9	24.9	73.7	21.2	Variable	3.3	9.8	Ci.-S.	Cu.-N.	□ d p.
19.	59.13	28.6	34	24.2	77.7	22.2	SSE	2.7	9.5	Ci.-S.	Cu.	□ d p.
20.	58.96	29	33.8	24.6	76.5	22.5	Variable	2.2	8	Ci.-S.	Cu.	□ d p.
21.	58.52	29.3	34.2	25.5	73.8	22.1	Variable	3.3	8.2	Ci.-S.	Cu.-N.	□ d p.
22.	58.12	28.8	34.2	25.4	73	21.1	SE quad.	2.8	9.8	Ci.-S.	S.-Cu.	□ d p.
23.	57.44	28.8	34.9	23.9	73.8	21.4	S	2.5	8.3	Ci.-S.	Cu.	□ d p.
24.	57.17	28.8	34	25.3	76	22.1	S, WNW	2.7	6.2	Ci.-S.	Cu.	□ d p.
25.	58.11	29.3	34.2	25.5	76.2	22.7	SSE	2.5	10	Ci.-S.	S.-Cu.	□ d p.
26.	58.93	28.6	33.4	24	73.3	22.6	SSE	2.7	9.7	Ci.-S.	Cu.	□ d p.
27.	58.86	27.7	32.9	24.1	82.7	22.6	S, E	2.5	9.5	Ci.-S.	S.-Cu.	□ d p.
28.	57.68	27.7	33.1	24.1	78.7	21.5	SSE, W	3.5	8	Ci.-S.	S.-Cu.	□ d p.
29.	57.63	28.5	33.1	24.6	78	22.4	SSE, WNW	2.7	8.5	Ci.-S.	Cu.-N.	□ d p.
30.	58.64	29.1	34.1	24	73.3	21.6	SE quad.	3.7	9	Ci.-S.	S.-Cu., Cu.	□ d p.
31.	58.55	29.4	34.1	25.5	68.3	20.4	SE	3.3		Ci.-S.	S.-Cu.	□ d p.
Mean	757.72	28.4	33	24.6	76.9	21.8		3	8.3			
Total												242.8

BAGUIO.<sup>a</sup>[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.		Upper.	Lower.		
1.	635.48	18.1	24.2	16	91	14	W quad.	253.7	8.7	A.-Cu.	SE	Cu.	mm. 10.7
2.	35.94	18.4	24.3	15.4	90.5	14.2	E, W	281.1	7.4	Ci.		Cu.-N. NNW, SE	10.4
3.	36.78	18.4	24.3	15.5	88	13.9	Variable	368.8	6.1	Ci.		Cu.	□ d p.
4.	36.28	18.5	23.7	15.5	90.2	14.3	Variable	289.8	6.7	Ci.		Cu.-N. SW	□ d p.
5.	35.57	18.4	23.7	16.4	92.2	14.5	SE, W	305.4	7.7	Ci.		Cu.-N. SE	1.6
6.	35.13	18.8	22.9	16	74	11.9	ESE	582.7	9.1	Ci.-S.	SW	Cu.-N. ENE	□ d p.
7.	34.47	18.2	22.6	15.6	80.3	12.4	SE	790.2	10	A.-Cu.	S	Fr.-N., Cu.-N. ESE	3.8
8.	33.82	17.3	20	16	89.3	13	SE	740	10	Ci.-S.		Fr.-N. SE	17
9.	32.87	16.6	18.3	15.9	95.7	13.4	SW	1,183.8	10			Fr.-N. SSW	86.9
10.	24.99	17.3	20.6	16	95.8	14	W	697	10			N., Cu.-N.	3.6
11.	36.14	18.2	23.4	16	96.3	15	W quad.	222.9	8.9	Ci., Ci.-Cu.		Cu.-N. W	50.3
12.	37.14	18.8	23.8	15.7	87.7	14.1	SW quad.	284.6	7.1	Ci.		Cu.-N. WSW	□ d p.
13.	36.98	19	24.2	15.7	81.8	13.4	W	317.1	3.6	Ci.		Cu.	□ d p.
14.	36.25	19.1	24.8	15.8	83.5	13.7	W	307.8	6	Ci.		Cu.	□ d p.
15.	36.49	19.4	24.6	16.3	75.7	12.7	W	337.8	5.1	Ci.		Cu.	□ d p.
16.	37.30	18.8	24.7	15.9	80.7	12.9	W	420.4	6.4	Ci.		Cu.-N. WNW	2.6
17.	37.71	18.9	26	16.3	81.8	13.3	Variable	297.9	5.9	Ci.		Cu.-N. SSW	3.9
18.	37.62	19.1	24.1	16.2	85.2	14	W, NE	254.1	7.9	A.-Cu.		Cu.-N. S	23.8
19.	37.52	19.2	24.1	15.9	86.5	14.2	SE	374.5	7.3	Ci.		Cu.-N.	1
20.	37.45	19	24	16.5	82	13.6	E	318.7	7.9	Ci.	S	Cu.-N. SE	13.7
21.	37.08	18.8	23.2	15.9	82.2	13.3	Variable	329.4	6.6	Ci.		Cu.-N.	25.9
22.	36.72	19.2	24.4	16.1	87.7	14.5	Variable	292.6	5	Ci.		Cu.	□ d p.
23.	36.15	18.7	24.5	16.1	86.5	13.8	SE, E	323.7	8.3	Ci.	NW	Cu.-N.	6.8
24.	35.86	18.7	23.3	16.1	89.8	14.4	Variable	260.2	9.1	Ci.	NW	Cu.-N. WSW	7.9
25.	36.74	18.8	24.5	16.2	92.3	14.8	SE, NE	272.7	7.4	Ci.		Cu.-N. SE	2.6
26.	37.40	18.6	23.5	15.5	92.8	14.8	ENE, W	295	8.4	Ci.	N	Cu.-N. E	49.2
27.	37.17	17.8	22.5	15	86.2	13.1	Variable	324.2	8.7	Ci.	NNW	Cu.-N. SE	26.1
28.	36.29	18.7	24	15.6	81.5	13.1	SE	289.2	7.9	Ci.	NE	Cu.-N. E, SW	5.8
29.	36.34	19.4	24.9	15.6	86	14.3	ESE	383.3	6.1	Ci.	NNW	Cu.	□ d p.
30.	37.15	19.2	25.8	15.8	86.5	14.2	SE	250.8	6.3	Ci.		Cu.	□ d p.
31.	37.25	20	26	15.8	78.2	13.5	E quad.	257.3	7.9	Ci.	NNW	Cu.-N.	□ d p.
Mean	636.33	18.6	23.7	15.9	86.4	13.8		384.1	7.5				
Total								11,906.7					354.4

<sup>a</sup>The barometric readings of this station are not reduced to sea level.

## Meteorological data for first and second class stations—Continued.

VIGAN.<sup>a</sup>[ $\phi=17^{\circ} 34' N$ ;  $\lambda=120^{\circ} 23' E$ ; barometer above sea, 14.7 meters; gravity correction not applied, -1.61 mm.]

Day.	Temperature.				Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total move- ment in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1..	757.12	28.7	34.8	24.1	69.3	19.9	NW quad.	227.2	1.3	A.-Cu.	Cu.	WNW		∠ p.
2..	57.72	28.7	33.9	25.3	69.5	20.1	S quad.	208.5	2.8	Cl.-S.	Cu.			∠ p.
3..	58.39	29.8	34.4	25.8	62.7	19.4	NW quad.	244.4	2	A.-Cu.	Cu.	NE, NW		∠ p.
4..	57.64	29.9	35.2	26.3	63.8	19.8	N quad.	205.8	2.8	Cl.-S.	Cu.	NW		∠ p.
5..	56.92	29	35.1	25.5	73.7	21.4	SE	161.4	3.3	A.-Cu.	Cu.-N.	NW	7.6	∠ a. ∠ 4° p.
6..	56.63	27.8	34.9	22.6	79.3	21.5	WNW	141.6	4.7	Cl.-S.	Cu.	NE, NNW	39.2	∠ 2° d p.
7..	55.48	28.2	32.7	25	73.2	20.7	ESE	145.8	8.3	A.-Cu.	Cu.-N.	E, ENE	1.8	d° a. p. ∠ 4° p.
8..	54.68	28.6	34.6	25	74.2	21.5	NE	138.2	8.2	A.-Cu.	Cu.-N.	SSE	5.1	d° p.
9..	51.61	25.3	27.4	22.6	89.8	21.5	S quad.	759.4	10		N.	S quad.	237.7	∠ 0° a. ∠ 2° d p
10..	56.15	26.8	28.7	25.1	90.8	23.7	SW	307.5	8.5	A.-Cu.	N.	SW	58.2	∠ a. p. d p.
11..	57.80	27.3	29.9	24.8	83	22.4	SSW	240.1	5.7	Cl.-S.	Cu.-N.	SE, SW	.5	d° a. p.
12..	58.60	28	32.2	25.8	80	22.4	SSE	245.5	4.2	Cl.-S.	Cu.	SSE		d a.
13..	58.36	28.5	31.7	26.4	77.3	22.2	SSE	227.6	4	Cl.-S.	Cu.	SSW		
14..	57.70	28.1	31.7	25.6	79.5	22.3	S quad.	181.1	4	Cl.	Cu.	SW, SSE		
15..	57.97	28	31.8	25.2	78.8	22.1	S quad.	199.5	3	Cl.	Cu.	S, SSW		∠ p.
16..	59.18	28.2	32.4	25.5	78.3	22.1	SSW	158.8	4.2	A.-Cu.	Cu.	SSW		∠ p.
17..	59.44	28.4	32.2	25.4	76	21.7	Variable	143.6	5.7	Cl.	Cu.	NNE		
18..	59.48	28.4	33.1	24.8	74.2	21.1	N quad.	162.7	3.8	Cl.-S.	Cu.	SW, NW		
19..	59.35	28.7	32.3	25.4	71.8	20.8	Variable	117.3	3.8	Cl.-S.	Cu.	NNE		
20..	59.16	28.7	33.2	24.7	73.8	21.4	N quad.	190.2	4.8	Cl.-S.	Cu.	SSW		
21..	58.68	28.6	33.5	25.3	73.5	21.3	NW quad.	197	4.5	Cl.-S.	Cu.	W, NNW		
22..	58.23	28.3	32.2	25	76.8	21.8	ssw, wsw	146	2.8	Cl.	Cu.	SW		
23..	57.60	27.6	32.7	23.6	76.7	20.8	Variable	196.8	3	Cl.	Cu.		7.6	∠ 4° p.
24..	57.35	27.8	32.2	24.8	74.2	20.4	ESE	185.7	2.7	A.-Cu.	Cu.	ESE	.3	∠ d ∠ p.
25..	58.37	28.4	33.2	25.3	77.3	22.1	WNW	139.5	4.2	Cl.-S.	Cu.-N.	NE		∠ 4° p.
26..	58.01	27.9	33.1	23.8	77.7	21.5	NNE	220.7	7.5	Cl.-S.	Cu.	SE, NNE	4.8	∠ 4° p.
27..	59.10	27	31.7	23.5	82.3	21.7	Variable	101.1	7	Cl.-S.	Cu.-N.	SE, SW		d a. ∠ 4° p.
28..	57.92	28.2	33	24.1	73.7	20.7	Variable	121.2	3.7	Cl.	Cu.			∠ p.
29..	57.90	28.9	33.3	25.3	72.8	21.3	WSW	107	1.8	Cl.-S.	Cu.	S		∠ 2° p.
30..	58.80	28.8	33.8	25.4	76	22.2	Variable	197.2	4	Cl.	Cu.		.3	∠ 4° d ∠ p.
31..	58.79	28.4	32.3	25.4	79.7	22.9	SSE	130.9	6	Cl.-S.	Cu.	NE		
Mean	757.78	28.2	32.7	24.9	76.1	21.4		198.4	4.6					
Total								6,149.3					363.1	

## TUGUEGARAO.

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied, -1.61 mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Mean.	Maximum.	Minimum.	Prevailing direction.	Force (mean).			Amount (mean).	Form and its direction.				
									Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	757.54	29.2	38.5	23.2	67.3	19.2	Variable	0.5	2.5	Ci.	Cu.		
2.	58.13	29.3	38.5	22.3	65.5	19.1	SSW, E	.7	5		Cu.-N.	SW	∠° p.
3.	59.52	28	36.5	22.5	70.2	19.2	NW	.8	2.3	Ci.-S.	Cu.	E, N	
4.	58.94	28	37.6	22.5	70.5	19.3	NW	.7	3.3	Ci.	Cu.	NW, SE	
5.	58.01	29	37.7	22.8	68.3	19.7	NW	.5	3.5		Cu.-N.	NE, SW	
6.	58.32	26	34.7	23	82.7	20.4	NW, SW	.3	8.3	Ci.-S.	Cu.-N.	S	20.8 ∠ 2° d° p.
7.	57.89	25.8	29.4	22.9	90.5	22.2	SE	.2	9.3	A.-S.	Cu.-N.	S	4.8 d° a. ∠ p.
8.	56.46	27.9	35.4	23.5	79.5	21.8	SE	2.3	8.3	Ci.-S.	N.	S	d p.
9.	54.17	26	29	23.7	88.3	22	SE	2.2	10	A.-S.	N.	S	23.4 ∠ p.
10.	55.26	26.8	31.1	23.5	86.7	22.4	SE	.3	7.8		Cu.-N.	W	3.6 ∠ a. p.
11.	57.35	28	36.4	23.5	83.2	23	Variable	.7	5.7	Ci.	Cu.	S	∠ 4° p.
12.	58.30	28.7	36.5	25	80.8	23.3	SE quad.	1.2	7.8	Ci., Ci.-S.	Cu.-N.	S, WNW	∠ a. ∠ 4° p.
13.	57.55	29.6	36.3	25	77.5	23.3	NE	.7	5.8	Ci.	Cu.	Variable	∠ 2° p.
14.	56.96	29.3	37.6	25	76.7	22.9	E quad.	.7	3.5		Cu.	N	
15.	57.14	28.4	38.2	24.5	80.2	22.6	SE, NW	.3	5	Ci.	Cu.	S, N	11.4 ∠ a. ∠ 2° p.
16.	58.36	28.5	35.8	23	74.8	21.2	Variable	.7	2.7	Ci., Ci.-S.	Cu.	NW	
17.	59.80	28	37.5	23	74.8	20.2	Variable	.7	7.5	Ci., Ci.-S.	cu, cu.-N.	SW	20.3 ∠ 2° a. ∠ 2° p.
18.	60.08	26.9	34.8	22.8	84.3	21.9	SE, NW	.3	8.3	Ci.	Cu.-N.	S, NE	13.2 ∠ 0° a. ∠ 2° p.
19.	59.67	27.3	35.7	23	77.5	20.6	S quad.	1	6.5	Ci.	Cu.-N.	S	∠ p.
20.	59.50	27.6	37	23	80.3	21.8	SE	.8	6	Ci., Ci.-Cu.	Cu.	SE	∠ p.
21.	59.08	27.7	36.9	23.5	78.5	21.3	Variable	1	5.8	Ci., Ci.-S.	Cu.	SE	∠ 4° p.
22.	58.90	28.6	37.1	23.8	72.5	20.4	SE	.5	2.5	Ci.	S.-Cu.		∠ p.
23.	58.07	29	36.9	23.4	75.8	22.1	SE, S	.3	6.7	Ci.-S., Ci.	cu., cu.-N.	s, SE	∠ p.
24.	57.40	29.4	38	24.1	72.2	21.2	Variable	.5	5.2	Ci.	Cu.-N.	SE	∠ 2° p.
25.	58.48	29.7	38.1	24.7	73.5	22	SE	1.3	3.5	Ci.-S., Ci.	Fr.-Cu.	S	∠ a. ∠ 2° p.
26.	58.96	29.6	37	25.2	75.5	22.8	S, NW	.3	6.8	Ci.-S.	cu., cu.-N.	s, NW	∠ a. ∠ 2° p.
27.	59.06	28.6	37.9	23.1	73.5	20.4	E quad.	.5	3.5	Ci.	Cu.	S	∠ 2° a. d° p.
28.	57.99	28.7	37.5	22.7	69.7	19.5	SE	1.3	4.7	Ci.	cu., cu.-N.	s, SE	17 ∠ 2° p.
29.	58.16	29.4	37.4	23.7	70.7	20.9	Variable	.5	7		Cu.	S	∠ p.
30.	59.14	29.6	37.5	24.5	70.5	21	S quad.	.7	2.5	Ci.	Cu.	S	
31.	59.66	29.3	38	23.6	71.5	21	SE, NW	.8	5.3	Ci.-S.	Cu.	SE	∠ p.
Mean	758.19	28.3	36.3	23.5	76.2	21.2		.8	5.4				
Total													114.5

<sup>a</sup> From May 9, 12.30 p. m., to May 13, 6 a. m., the thermometers were installed at the flat roof of the station, as the thermometer shelter was partly destroyed owing to the violence of the gale.

Meteorological data for first and second class stations—Continued.

## APARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction. Upper. Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.		mm.	
1.	757.59	27.2	32.9	23.6	77.3	20.6	NE	302	0.2	----- S.-Cu.		< p.
2.	58.26	27.3	32.3	22.4	78.2	20.8	E quad.	354.2	.2	----- S.-Cu.		b a. < p.
3.	59.92	26.8	32	22.4	80.3	20.9	E	313.3	.8	A.-Cu. SE		b a. < p.
4.	58.95	27.2	32	23.1	80.7	21.4	ENE	330.6	.5	----- Cu.-N.		b a. < p.
5.	57.99	27.3	32.1	21.8	79.3	21.2	E	301.8	.5	Ci.-S. ----- Cu.-N.		b a. < p.
6.	58.14	26.6	30.5	22.6	84.2	21.6	E	207.4	6.7	Ci.-S. SE, E		b a. < p.
7.	57.28	25.8	29.5	23.1	86.7	21.4	SE	261.4	8.8	Ci.-S. SW	5.4	b a. < p.
8.	55.65	27.9	33.9	24	76.7	21.1	S	446.7	8.5	Ci.-S. W	5.1	b a. < p.
9.	53.10	25	27.5	22.4	90.8	21.3	S	560	10	Ci.-S. ----- S.-Cu.	131.4	b a. < p.
10.	54.91	26.2	28.7	24.1	86	21.9	NW	568.3	8.2	Ci.-S. NNW, W	1.3	b a. < p.
11.	57.30	27.4	32	23.4	83	22.4	NE	211.4	1.3	----- S.-Cu. WSW		b a. < p.
12.	58.31	26.9	32.6	24.7	89.5	23.5	NE	215.4	6.3	Ci.-S. E	3.8	b a. < p.
13.	57.59	27.8	32.7	24.2	83	22.9	SW, NE	255.6	1.5	----- Cu.-N. N.S, NE		b a. < p.
14.	56.93	28.4	32.6	24.5	77.7	22.1	NE, E	311.1	.2	----- S.-Cu. W		b a. < p.
15.	57	28.3	33	24.6	80.3	22.8	Variable	242.1	1.8	A.-Cu. SW		b a. < p.
16.	58.43	27.6	33.3	24	73.7	20.2	N, SW	481.8	7	Ci. ----- Fr.-Cu. S		b a. < p.
17.	59.71	27.2	32	22.5	79	21.1	Variable	335.5	4.2	Ci. E	9.2	b a. < p.
18.	59.84	26.8	32.2	22.6	81.8	21.3	Squad.	354.3	8.2	Ci.-S. W	3	b a. < p.
19.	59.40	27.2	32.9	23.3	80.7	21.4	S	351.1	6	Ci.-S. NW, W	16	b a. < p.
20.	59.35	26.7	33	23.6	81	21.1	W quad.	251.2	4.5	Ci.-S. W		b a. < p.
21.	58.98	27.7	33	23.7	79.3	21.8	Variable	326.4	1.7	A.-Cu. SW		b a. < p.
22.	58.83	27.6	32	24.2	77.7	21	Variable	329.3	2	Ci. NE		b a. < p.
23.	57.80	28.2	32.6	23.4	80.3	22.7	SE	247.4	6.2	Ci.-S. W		b a. < p.
24.	57.31	28.5	33	24.6	77.3	22.2	SE, N	326.7	1	----- S.-Cu. SE		b a. < p.
25.	58.42	28.8	33.5	25.1	79.3	23.2	NE quad.	260.7	2.3	A.-Cu. SW		b a. < p.
26.	59	28.3	33	24.4	79.5	22.5	Variable	278	6.3	A.-Cu. E		b a. < p.
27.	59.04	28	32.5	24.1	82	22.8	N quad.	269.2	.7	----- Cu.-N. NE		b a. < p.
28.	57.75	28.4	33.3	23.5	75.5	21.7	SW, NE	381.1	2	Ci.-S. N		b a. < p.
29.	57.94	29	34.1	24.7	75.3	22.3	Variable	346.6	1.5	----- Cu.-N., S.-Cu.		b a. < p.
30.	58.93	28.7	33.4	24.8	72.8	21.1	S, E	292	1.8	Ci. SE		b a. < p.
31.	59.33	28	33.1	23.6	77.7	21.8	S quad.	303.2	3.7	Ci.-S. E		b a.
Mean	758.03	27.5	32.3	23.6	80.2	21.7		323.1	3.7			
Total								10,015.8			175.2	

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, MAY, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Jolo	.4	.2			22.5											
Isabela, Basilan							9.6	.5	1.6							
Zamboanga				.5									9.1	11	12.7	1.8
Davao		30	4.1	1.8			9.9		1.8	15					3.8	
Cotabato				16	8.7	5.6								7.1		
Cagayan, Misamis			16.8	23.4		4.8							17.3	36.3	.3	
Butuan	1.1		3.3	20.4	2.3	53.1	15	6.4	.3				17.5	7.1		3.6
Dumaguete			1.3		9	16										
Yap, W. Carolines	21.1	3.3	3.3	6.1	10.1	.8	2.8		.8	3	.6				.3	.5
Maasin			49.1	57.1	65.8				17	6.1						
San José Buenavista			3.5	10.2	1.3	36.3	1.5		14							6.4
Cuyo			3.3	8	49.3	43.3	38.6	16.5	11.2	.8						
Guiuan	5.6	52.3	75.5	123.5	80.8	1.5										
Borongan	.3	29.8	69.1	99.8	240.5	38.6	8.2									
Masbate			3	1.5	4.3	73.7	1.3		.5							
Romblon <sup>a</sup>		.3	.3		10.1	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Batag		26.6	18.3	19.5	133.9	43.4	19	2.5	7.9							
Gubat		60.7	54.6	25.4	51.3	13										
Sumay, Guam		.6		.6							1.3		1.3		3.8	5.1
Calapan			17.8	1.8	10.9	154.9	21.9	7.1	8.9	.5						
Virac		15.2	3.8	14.2	126.5	1.3										
Nueva Caceres	.5	4.1		2.5	13.1	5	1.3									
Batangas			7.2	6.9	.3	44.5	11.2	15.7	8.9							
Silang			14.2		42	57.4			9.6							
Santa Cruz, Laguna		2.1	4.5	5.9	5.6	19.5	4.1	.3	.4							
Antipolo			1.8		1.5	4.6	2.3	5.4	9.2		1.3					
Iba	6.1	3		4.7	14.2	.5	27.1	74.3	42.4	14.2						
Tarlac						4.1	1.8	24.1	10.5	8.1						22.1
Baler	2.5	23.9	2.5	1	.3	60.5	48.7	41.9	6.9							
San Fernando, Union						8.1	5.4	80.5	1							9.1
Echagüe						9.9	6.6	6.1	4.9		11.4		1.3	.5		.3
Candon				1	2.3	4.6	26.7	12.4	231.7	7.6						
Laoag <sup>c</sup>		20.6						13.4	(b)	(b)	1.8					2.3
Santo Domingo, Batanes		2.8	4.3	14.9	.3		15.7		13		10.7		.2	1.1	45.7	51.3

Station.	Day of month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.		
Jolo		.1	42.9	9.5	.5	6	3.7	.2	15.5	.4		39.7	1.8	.3		184.3	
Isabela, Basilan		7.1	3.8			3	42.9	.8		9.1	.8	.8				114.6	
Zamboanga		14.5	2.8	4.8			6.1	1.3							7.1	74.8	
Davao		18		11.4		5.3	6.4	19.3	9.1			1.8				137.7	
Cotabato		24.1				8.9	13	47.2	14.7	.5		47.5	5.8	9.1	13.2	4.1 213.8	
Cagayan, Misamis			6.6				1.8	32		2.8						.3 142.4	
Butuan	.8	6.3	1.5	.8		2.5	9.9	26.2	2.3		3.6	1.5	13.2	35.6	4.6	238.9	
Dumaguete			11.5	1.7		1.5	1	13.2	1	3.5	15				.3	75	
Yap, W. Carolines	7.1	1.8	5.6	2	1.8			13.7	7.4	.3	1.5	1.5	.6	7.6	3.3	106.9	
Maasin								3							2	200.1	
San José Buenavista	4.6	3	.5					30.2	3	18.8	.3	.5	.3	2		136.4	
Cuyo	16.3	.3				1.3		16.8	2.5	29.3	8.2		13.5			252	
Guiuan		8.4	6.6	.5	.8	3.5	7.2	23.1	1				17	19.5	24.6	451.4	
Borongan		5.8	1.8	14.2	2.5	25.4	26.2	6.8	2.8	.3	.5	14.2	1	.6	28.7	617.1	
Masbate																84.3	
Romblon <sup>a</sup>	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)		
Batag		30.5		2.5			23.9	12.2						3.8	2	346	
Gubat				2.5	.8		20.3							3	8.1	239.7	
Sumay, Guam		3.2			1.3	.6		3.2			13.4			3.2	1.3	38.9	
Calapan		.3	9.4	.8	1.3	3	.5	7.9	.3	2.8	19.1				11.2	277.7	
Virac		2.8	(b)	(b)	(b)	23.1	.6	20.9	.8					1	4.6	215.6	
Nueva Caceres	5.6		3.3					7.4			5.6	22.8				71.2	
Batangas											1.3	19				115	
Silang				24.9					4.1	9.7						161.9	
Santa Cruz, Laguna		1.3							.5	1.3						45.5	
Antipolo	8.1									5						39.2	
Iba					21.1			1.3	.5	10.7	.8	6.9				227.8	
Tarlac	20.3	5.1						10.2		12.7	33.3					152.3	
Baler	3	1.8	1.8	3.6	1.5	23.1	7.1	21.1	3.8	2	9.1	.1			23.9	290.1	
San Fernando, Union								(b)	(b)	4.1	2.5	.8				111.5	
Echagüe	4.6			15												60.6	
Candon										71.1				13.2		370.6	
Laoag <sup>c</sup>											11.9			3.8			
Santo Domingo, Batanes	1.3	.8														162.1	

<sup>a</sup> The raingauge was destroyed by the typhoon of the 6th.<sup>b</sup> No observation.<sup>c</sup> The raingauge was blown over by the typhoon in the afternoon of the 9th.

## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, MAY, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Butuan.		Dumaguete.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	32.4	24.2	32.1	22.8	30.8	24	31.8	22.8	33.8	-----	32.4	23.6	28.3	23.2	31.1	25.1
2	32.6	23.1	35.6	23.9	32.7	23.4	32.7	22	34.8	-----	32.9	23.5	29	23.8	31.3	24.1
3	32.4	23	31.2	22.8	32.1	23.5	32.6	22.5	33.8	-----	33.2	23.8	28	24.2	32	23
4	31.8	22.2	31.4	23.1	29.9	23.2	30.7	22.1	32.4	-----	32.4	23.5	28.2	24	33.6	24.5
5	32.6	23.5	31.2	24.4	29.7	24.5	31.1	22.1	31.2	-----	31.1	23.5	29.7	23.1	34	24.5
6	31.4	23.1	30.6	24.6	29.1	26.1	31.7	22.8	29.2	-----	33.5	23.6	32.6	23.8	27.8	23.5
7	34.7	23.8	31.4	22.5	30.8	23.4	32.2	21.3	33.2	-----	31.8	22.2	31.6	22.7	30.8	24.3
8	34.9	23.7	33.4	22	32.1	23.4	32.2	22.5	33.7	-----	32.5	23.1	32.6	23.4	31.2	23.3
9	33.1	24.2	33.1	22.6	31	24.5	32.3	22.9	32.8	-----	32.8	23.2	31.3	23.8	33.1	24.3
10	33.6	22.5	34.4	22.4	32	23.5	32.7	23.2	34.2	-----	32.9	23.9	32	23.6	31.8	23.6
11	34.6	23.2	35.6	22.3	31.7	23.4	32.4	23	36	-----	33.9	24.3	33.8	24.1	31.8	23.6
12	35.7	23.2	34.9	23	32.4	24.4	33.6	23.5	35.7	-----	33.3	23.9	33.5	25.1	31.8	23.4
13	32.6	23.7	33.6	22.6	31.8	24.5	33.6	23.2	36.2	-----	33.4	24.4	34.1	24.5	30.9	24.5
14	31.8	22.9	31.8	23.6	30.3	24.4	32.7	22.2	36.3	-----	32.4	23.2	33.7	24.4	31.6	24.7
15	27.9	22.7	30.6	22.8	29.9	23.5	32.2	22.8	33.4	-----	32.3	23	33.4	24.1	32.5	23.9
16	34.7	22.3	32.6	21.9	31.5	23	32.7	22.8	35.5	-----	32	22	33.7	23.7	32.5	23
17	33.6	22	32.1	21.6	30.4	23.8	33.9	21.9	35.4	-----	32.4	23	33	24.1	32	24.9
18	30.1	22.7	29.1	23.6	28.8	23.9	33.5	22.3	34.3	-----	32.6	22.9	32.7	23.9	31	24
19	29.4	22.2	32.2	22.9	31	23.2	32.4	22.4	32.5	-----	32.7	23.2	30.2	23.5	30.4	24.6
20	30.3	21.3	31.9	21.9	31.2	23.6	34.5	22.4	34.4	-----	31.9	21.7	31	23.7	30.7	24.6
21	33.4	21.8	31.2	23.1	29.9	24	32.8	22.4	34.3	-----	33.1	23.2	33.1	24	31.2	23
22	30.8	22.7	29.1	23.1	30.1	25	32.5	22.8	31.7	-----	31.9	24	32	23.7	31	25.8
23	29	22.3	30	23.1	32.1	23.5	30.5	22.6	33.8	-----	32.5	23.8	31.4	24	30	24.4
24	30.3	23.2	29.6	22.7	28.9	23.7	28.7	22.9	31.2	-----	31.1	22.4	29.6	23.8	30.1	25
25	30.3	22.5	29.2	22.6	27.9	22.9	30.6	22.1	31.8	-----	29.4	22.2	30.4	23.5	30.5	24
26	31.1	21.9	31.2	21.4	29.9	23	32.2	22.9	33.4	-----	22.5	31.4	23.4	-----	30.8	24
27	33.9	21.9	32.1	22.6	31.1	23.4	33	22.8	34.2	-----	23	31.7	22.1	-----	30.3	24.1
28	31.8	22.2	32.1	22.7	29.6	23.5	32.7	22.7	33.1	-----	23	32.2	23.5	31.5	31	24.4
29	33.3	21.7	32.9	21.7	30.4	23	32.7	22.5	34	-----	24	32.3	22.9	31.1	30.7	23.6
30	30.6	22.4	32.9	22.6	30.5	23.2	30.3	21.9	33.2	-----	22.8	31.2	22.7	29	31.4	24.1
31	32.3	23.2	33.1	23.9	31.9	23.9	32.2	22.2	33.7	-----	22.9	32.5	23.5	28.5	31.8	25.4
Mean	32.2	22.8	32	22.8	30.7	23.8	32.2	22.5	33.7	-----	32.3	23.2	31.3	23.8	31.3	24.2

Day.	Yap, W. Carolines.		Maasin.		San José Buenavista.		Cuyo.		Borongan.		Masbate.		Romblon.		Batag.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	28.5	24	31	23.4	32.9	23.6	32	25.6	31.2	22	34.6	24.5	30.5	23.7	30.5	23.7
2	29.7	-----	31	23.1	34	21.9	32.9	26.2	30.4	22.5	34.5	23.8	34.7	24.1	30	23.4
3	31.8	23.4	33	23.1	29	22.9	33.1	26.9	26.3	22.9	34.2	25	34	24.5	30.5	21.9
4	31.8	25	31.6	23.1	33.4	23.2	32.4	25	27	22	33.4	26	35.6	24.5	30.5	23
5	31.4	23.5	28.6	21.8	32	24	32	25.6	27	22	35.2	24.2	33.6	25.7	25	21.5
6	31.4	24	29	21.9	27.9	24.4	30.3	23.2	30	22	33.5	24.4	33.1	21.7	28.5	23
7	32.1	25.5	30.7	21.8	28.9	24.2	26.7	24.1	29.3	22	33.5	24.4	33.1	21.7	30	21.5
8	31.9	25.2	32	22.8	30.2	23.1	30.6	24.3	30.5	23.9	32.2	24.5	34.9	23.3	30	21.5
9	32.7	25	31.4	24.4	31.8	23.6	30.3	24.6	31.1	23.5	30.6	25.5	34.1	24.2	31	21.6
10	33.2	25.5	32.4	24.4	32.5	23.5	32.6	24.3	31.6	22.4	31.6	26.5	33.1	25	32	21.8
11	32	25	32.4	24.8	31.6	24.7	33	24.2	32.4	23	32.2	27	34.4	25.7	31	23.2
12	32.9	25	32.5	24.9	32.3	23.5	33.3	24.9	31.2	22.8	32.2	25.4	35.1	25.6	31.6	23.5
13	32.8	25.6	33	24.8	33.4	25.5	33	25.4	31.2	22.2	32.6	25	35.5	24	30.6	22.9
14	31.8	25	33	24.6	33.5	24.6	33.2	25.9	31.3	22.3	32.8	26	35.3	23	32.5	23.2
15	33.2	24.8	33.1	24.7	31.6	24.6	33.2	25	31.4	22.5	33.2	26	35.5	23.6	31.5	22.9
16	32.7	25	33.1	24.6	34	24.1	33.7	24.9	31.7	22.2	32.8	25.6	34.7	24.7	32.8	23.2
17	32.8	24.2	32.4	25.2	33.6	24.2	32.7	26.3	31.4	22.7	33.2	25.6	37.3	24.4	31.2	22.7
18	31.7	24.6	32.6	24.6	32.4	23.8	32.2	24.8	31.5	22	32.2	26.2	35	23.2	31.4	23.5
19	30.7	24.8	32.4	24.3	29.9	23.6	29	27	30.9	23.7	33	27	35.9	23.8	30	21.5
20	32.4	24.6	32	23.9	33.4	23.1	32.6	24.2	31.2	22	32.4	26.5	36.4	26.7	30.9	22.7
21	32.1	24.5	31.8	23.8	34.6	23.4	33	25.5	31.8	23.4	33	26.6	36.7	24.5	30.9	22.5
22	32.9	24.3	33	23.5	33.8	24.1	32	27.1	31.3	22.9	33.5	25.4	35.6	26.1	30.8	23
23	32.7	24.8	34	23.4	32.9	24.1	31.9	25.4	31.4	22.2	32.2	26.5	35.1	24.8	30	22.9
24	33.1	24	33.6	23.4	29.8	24.3	31	25.1	29.8	23.8	32.8	26.2	35.6	25.3	29	21.6
25	32.4	24.6	33.3	23.6	30	23.1	28	22.8	30.5	22.7	30.5	26.5	31.3	22.9	28.5	22.7
26	32.5	24	34	25.4	29.9	24.5	28.5	24.4	31.3	23	29	26.5	33.7	24.6	30.4	23.8
27	32.7	24.5	34.2	25.1	29.8	23.4	31.5	23.8	31.7	22.1	30.8	25.4	33.1	23.9	30.5	33.8
28	32.8	24.7	34.3	24.7	32.4	24.4	32.7	24	31.4	22.9	33.2	25.4	34.6	24.7	30.8	23.6
29	32.2	25.2	34.4	25.6	33.2	23.4	33.3	24.4	30.1	22.6	32.8	26	35.6	23.8	31	23
30	32.9	24.7	34.3	25.1	34.2	23.7	33.4	23.6	31.5	21.9	32.8	25.6	35.5	24.4	30.8	23.5
31	31.8	24.1	34.1	24.8	33.4	24	32.1	26.5	31.4	23.5	33.2	26.5	34.6	25	31.2	24
Mean	32.1	24.6	32.5	24	32	23.8	31.8	25	30.8	22.7	32.6	25.8	34.8	24.4	30.5	22.8

## Maximum and minimum temperatures for third-class and rain stations, May 1913—Continued.

Day.	Gubat.		Sumay. Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.		Sta. Cruz, Laguna.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30.8	26.3	31.3	25.2	32.5	23.5	31.2	20.8	33.5	19	35.5	23.4	32.3	20	32.8	23.7
2	32.8	25.2	31.8	25.3	32	24	33.1	20.5	33.9	19.7	36.2	22.9	32	20.4	32.5	23.9
3	28.1	23.6	31.2	25.6	31.1	23.6	32.2	21	31.2	22.4	33.2	23.3	32.6	19.1	30.2	23.5
4	30.8	23	31.9	25.5	31.1	22	33	21.1	33.5	22.6	31.3	21.6	30.2	20.3	31.4	23.1
5	26.9	23.3	31.8	25.3	32	21.5	27.5	22.8?	30.7	22.5	32.8	21.3	30.8	19	32	22.6
6	27.4	23.6	31.3	25.5	33	23	29.2	21.8?	27.7	22	30	23.4	30.1	18.7	29.5	24.8
7	30.5	24.4	30.8	25.7	26.9	23.5	30.8	23	31.6	22.3	26.5	24.1	27.5	18.2	28.2	23.5
8	29.8	23.8	31.8	25.2	30	22	31.5	22.8?	33.4	22.3	30.3	23.6	27	18.6	32	23.1
9	31.7	25.2	31.6	25.3	27.7	22.2	32.9	23.2?	33.3	22.5	27.8	24.2	27.8	18.3	29.5	24.5
10	32.8	24.3	32.1	24.5	31.1	22.5	33.5	22.8?	32.7	22.6	31	24	29.3	18.8	32	23
11	32.8	24.6	31.8	22.5	31.5	22.5	33.2	22.3	33.5	23	31.5	23.3	30.1	19.1	33.7	23.5
12	32.8	23.8	31.4	24.8	31.5	22.8	33	22	33.3?	21.4	32.8	22.2	32.5	19.9	33.9	22.9
13	33.8	24.4	32.4	25.6	31.5	22.5	32.5	22.1	35.9	22.5	32.3	24.9	32.8	20.1	35	23
14	33	24.1	32.6	25.7	31	22.4	33.5	22.5	35.1	22.6	33.2	21.8	32.2	20.3	34.4	21.7
15	34	23.9	29.4	23.2	32.1	22.4	33.1	23	34.9	21.5	33	23.4	32.6	20	34	21.7
16		23.1	30.2	23.6	31.6	21.5	33.4	22.3	35	22.1	33.3	23.8	32.9	20.2	34.5	23
17		23.9	31	22.8	33	22	32.7	22	36.7	21.5	33.2	23.3	32.6	20.3	36.4	23
18		24.8	32.2	25.2	32.7	22	33.3	21.4	35.6	20.7	34.5	23.4	33.1	20	36.4	23.5
19		26.2	31.2	23.5	32.2	23			33.6	19.5	34.2	24.1	31.5	19.4	34.9	23.5
20		26.5	31.8	25.5	33	23.2			35.6	21.2	34.7	24.6	31.2	19.3	35.1	24.6
21		25.3	31	25.6	32.2	23.7			34.8	18.3	35.6	24.3	31.8	19.7	35.1	24.8
22		24.1	31.3	25.2	32.5	23	32.5		34.5	18.2	35.4	22.3	31.5	19.5	34.8	22
23		25.5	30.7	25.3	31.5	24	32.2	22.4	32.9	20.9	35.2	24.7	32	19.4	34.3	24.3
24		23.9	32.2	25.7	32.4	23.4	29.8	22	34.5	20.3	33.8	24.8	31.2	19.9	34.6	24.5
25		24.2	31.8	25.2	31.2	23	30.2	23.2	33.6	21.1	33.9	24.3	31.8	20	34.3	24.1
26		26.5	32.3	25.8	32.2	23.4	32.5	23.4	33.6	21	34	24.3	31	19.3	34.6	24.9
27		25.2	30.3	24.4	30.1	23	33	23.6	34.3	21	32.4	23.4	29.6	19.4	34.2	24.4
28		25.4	31.7	24	32	22.9	32.6	22.1	33.5	19.1	33.1	23.2	30.1	19.9	35.7	23.3
29		25.5	31.1	24.7	32	22	32.4	22	34.9	19.8	34.3	23	30.5	19.3	36	23.4
30		24.6	31.7	25.9	32.2	22.4	32.3	22.1	34	18.9	34.9	23.2	29.9	19.1	34.1	23.9
31		25.5	31.4	25.3	32.1	23.5	34.4	22.5	34.6	21.5	34.4	24	30.3	19	34.1	23.4
Mean	31.2	24.6	31.5	24.9	31.5	22.8	32.2	22.2	34.1	21.1	33	23.5	31	19.5	33.6	23.5

Day.	Antipolo.		Iba.		Tarlac.		Baler.		San Fernan- do, Union.		Echagüe.		Candon.		Sto. Domingo, Batanes.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	35.1	22	33.4	23.4	36.9	24		21.5	33	23.4	36.6	22.4	32.6	25.1	32	23.6
2	35.6	22.2	33	23.2	37.1	23.5		22.7	34.4	24.8	36.4	20.9	32.4	25.5	31.4	23.2
3	34.3	21.7	33	23.5	37.7	23		22.5	33.8	24.5	36.9	20.9	32.5	26.1	29.4	22.9
4	34.8	21.7	33	23.3	37.4	22.5		21.8	34	24.8	35.3	21.9	32.3	25.8	30	22.6
5	35.5	22.7	32.9	23.1	37.3	23.4		22.9	32.8	23.2	36.6	21.9	31.7	26	31.3	23.8
6	30.1	23	32.2	23	32.7	22		23.4	33.7	24.2	32.9	22	31.5	24.5	31.2	24
7	29.3	23.6	33.9	24.5	31.2	23.8		24.1	33.1	23.6	30.1	22.9	31.4	25.1	30.8	24.4
8	30.6	23.5	28.1	24	29.3	23		23.9	28.2	22.4	32.7	22.5	31.3	24.7	31.4	24.4
9	29.2	23.8	28.5	23.5	30.5	24		23.6	26.6	23.1	25.6?	22.9	25.6	24.4	30.5	24.6
10	31.9	23.6	30.3	23.5	31.5	22.6		23.5	31.2	21.8	36.7	22.8	28.6	24.7	29.2	23.7
11	32.6	23.8	31.4	23.7	32.2	23.4		25	32.3	22.1	35.9	23.4	30.9	24	31	23.9
12	35.5	22.3	31	23.5	33	22.9		24.2	33.9	24.4	36.3	23.1	31.4	25.6	30.6	24.2
13	34.7	22.2	31.5	22.5	36	23.2		23.4	34.2	25.1	37.7	23.3	31.2	25.8	30	24.8
14	35	22.6	31.5	21.9	36.2	22.4		23.5	32.4	22.9	36.6	22.3	30.9	26	29.9	25.5
15	34.1	22.8	31.5	22	36	23.1		22.9	34.7	22.2	37.6	23.4	31.7	24.5	29.9	24.9
16	35	23.3	31.9	21.9	36.4	21.5		24.2	33.2	23.4	37.3	22.3	30.7	24.5	27.4	23.4
17	36.1	23.5	32	22	35.7	22.4		23.3	32	22.6	36.6	21.7	31.4	25.1	26.9	21.8
18	34.3	22.3	32	22.5	36	22		23.7	32.9	22.4	35.8	22.8	31.6	25	31	24.2
19	36	22.2	32.9	23	35	22.7		22.5	33.3	23.6	36	22.5	31.6	25.5	31.5	24.8
20	35.7	22.6	32.5	22.5	35.4	21.4		22.4	33.2	23.5	36.3	21.3	31.9	24.7	31	23.4
21	35.8	22.5	33.4	23	35.2	22.6		23.9	32.9	23.6	35.8	22	32.6	24.6	31.4	23.4
22	36.6	21.3	33.1	22	36.3	21.7		21.5	33.2	23.6	36.3	21.4	31.8	25	31.5	23.7
23	35	23.2	32.5	22.5	35.9	22		23.8	33.2	23.8	35.8	22.6	32.4	25.5	31.8	23.4
24	35.5	23.3	32.6	22.9	35.9	22		23.2			36.3	22.4	31.9	24.5	32.2	25.6
25	35.4	23.3	32.8	22.9	34.8	21.5		23.2	32		37.1	21.5	31.9	24.7	31	24.7
26	34.8	23	32.8	22.7	36.7	21.6		23.4	33.5	24	37.7	22.6	32.4	24.7	31.2	23.9
27	33.9	22.8	32	23	36	23		22.9	32.4	22.9	37.7	22.9	30.5	24.7	31.7	24
28	36.1	21.8	32.1	22	34	22.4		22.4	34	24.3	37.7	22.3	31.8	24.9	32.4	24.3
29	36.1	23	32.3	22.8	35.2	23.2		22	33.7	24.4	37.9	20.4	31.5	25.5	32.7	25.8
30	36.8	21.8	33.2	23.3	35.3	23		21.7	33	23.6	37.6	20.3	32	25.2	32.7	25.6
31	36.3	23	34	21.6	35.6	22.5		22.6	33.4	24.2	36.2	20.9	31.3	24.5	32.4	25.6
Mean	34.4	22.7	32.2	22.9	35	22.7		23.1	32.8	23.5	35.9	22.1	31.4	25	30.9	24.1

# SEISMOLOGICAL BULLETIN FOR MAY, 1913.

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## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

1, 4<sup>h</sup> 20<sup>m</sup> [1, 12<sup>h</sup> 20<sup>m</sup>]. **Maasin** (SW of Leyte). Oscillatory earthquake of intensity II–III, duration 3 seconds.

2, 11<sup>h</sup> 45<sup>m</sup> [2, 19<sup>h</sup> 45<sup>m</sup>]. **NE of Mindanao**. Earthquake of intensity III–IV in the whole of the Surigao peninsula. This and the other earthquakes felt in this region during the month of May may be considered as repetitions of the April seismic period, unless different places of origin are assigned.

3, 5<sup>h</sup> 56<sup>m</sup> 10<sup>s\*</sup> [3, 13<sup>h</sup> 56<sup>m</sup> 10<sup>s</sup>]. **NW of Luzon**. Earthquake of intensity IV, felt in the Provinces of Ilocos Sur, Ilocos Norte, Union, and slightly in the Mountain Province. Its origin was close to the coast of Ilocos Sur.

3, 23<sup>h</sup> 35<sup>m</sup> [4, 7<sup>h</sup> 35<sup>m</sup>]. **NE of Mindanao**. Earthquake of intensity IV–V. There was a repetition of less intensity two hours afterwards.

4, 21<sup>h</sup> 10<sup>m</sup> [5, 5<sup>h</sup> 10<sup>m</sup>]. **Nueva Caceres** (SE of Luzon). Earthquake of intensity II–III.

6, 9<sup>h</sup> 28<sup>m</sup> 54<sup>s\*</sup> [6, 17<sup>h</sup> 28<sup>m</sup> 54<sup>s</sup>]. **W of Luzon**. Earthquake felt in the Province of Pangasinan, and in the southern part of La Union and Benguet; its intensity did not pass III–IV and its duration was scarcely 2 seconds. The epicenter appears to be in the NE part of the Lingayen Gulf.

7, 0<sup>h</sup> 03<sup>m</sup> 29<sup>s\*</sup> [7, 8<sup>h</sup> 03<sup>m</sup> 29<sup>s</sup>]. **NE of Mindanao**. Earthquake of intensity V–VI. There were three repetitions of less intensity in the next 50 minutes.

7, 20<sup>h</sup> 04<sup>m</sup> 20<sup>s\*</sup> [8, 4<sup>h</sup> 04<sup>m</sup> 20<sup>s</sup>]. **NE of Mindanao**. Earthquake of intensity V, preceded and followed by other shocks of less intensity.

8, 17<sup>h</sup> 35<sup>m</sup> 09<sup>s\*</sup> [9, 1<sup>h</sup> 35<sup>m</sup> 09<sup>s</sup>]. **NE of Mindanao**. Earthquake of intensity IV–V.

14, 9<sup>h</sup> 07<sup>m</sup> 43<sup>s\*</sup> [14, 17<sup>h</sup> 07<sup>m</sup> 43<sup>s</sup>]. **SW of Luzon**. Earthquake of intensity III–IV felt all along the coast of Zambales, Cavite, and Batangas; its epicenter was in the China Sea at a little more than 120 kilometers to the WSW of Manila.

16, 12<sup>h</sup> 00<sup>m</sup> 32<sup>s\*</sup> [16, 20<sup>h</sup> 00<sup>m</sup> 32<sup>s</sup>]. **Vigan** (NW of Luzon). Oscillatory and subsultory earthquake, intensity IV, duration 3 seconds. Its origin seems to have been in the same place as the one on the 3d, viz, in the sea at a short distance from the coast of Ilocos Sur.

17, 10<sup>h</sup> 28<sup>m</sup> 07<sup>s\*</sup> [17, 18<sup>h</sup> 28<sup>m</sup> 07<sup>s</sup>]. **NE of Mindanao**. Earthquake of intensity V–VI; felt throughout the Surigao peninsula and the northern part of the Agusan Valley. It was repeated with less intensity at 13<sup>h</sup> 05<sup>m</sup> [21<sup>h</sup> 05<sup>m</sup>].

18, 20<sup>h</sup> 55<sup>m</sup> 00<sup>s\*</sup> [19, 4<sup>h</sup> 55<sup>m</sup> 00<sup>s</sup>] **Butuan** (N of Mindanao). Oscillatory earthquake, direction S–N, intensity IV, duration 10 seconds.

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance was registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observer who sent the report. All time indications, are in Greenwich mean time (Midnight=0<sup>h</sup>), insular time being added in brackets for the convenience of the Philippine readers.

20, 16<sup>h</sup> 45<sup>m</sup>\* [21, 0<sup>h</sup> 45<sup>m</sup>]. N of Luzon. Oscillatory earthquake, direction N-S, intensity III; felt in the northern part of Ilocos Norte, Cagayan, and the Mountain Province.

29, 13<sup>h</sup> 30<sup>m</sup> 11<sup>s</sup>\* [29, 21<sup>h</sup> 30<sup>m</sup> 11<sup>s</sup>]. N of Luzon. Earthquake of intensity VI-VII, felt principally in the Provinces of Ilocos Norte and Sur and in the northern part of the Mountain Province and of Cagayan. The meizoseismic area included, according to the data at our disposal, all the Province of Ilocos Norte, the northern part of the Mountain Province, and the NW of Cagayan. The loud subterranean noises were very noticeable in both Ilocos Norte and Sur and they appeared to come from the E before the first perceptible shocks. The duration of the earthquake was not less than 30 seconds in any part of the area. Judging from the different intensities in Ilocos and Cagayan it would appear that the epicenter must be placed within the Island of Luzon, near the central Cordillera, not far from parallel 18° N, which is a region inhabited by the non-Christian tribes, whence it is impossible to obtain data. It is not very probable however that the intensity was much greater there than in the neighboring Provinces of Ilocos and Cagayan, and if it were much greater its area must have been very reduced, for it was not perceptible farther south than 170 kilometers. The earthquake was recorded by the seismographs not only of the Philippines but also by those of the Far East. At 20<sup>h</sup> 25<sup>m</sup> of the 29th [30, 4<sup>h</sup> 25<sup>m</sup>] there was a repetition of intensity III-IV perceptible only within 70 kilometers of the epicenter.

#### RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0<sup>h</sup>. Instrument: Wiechert seismograph; 1,000 kilograms.  $A_N$ :  $T_0=6.2$ ,  $\epsilon=2.21$ ,  $\frac{r}{T_0^2}=0.055$ ;  $A_E$ :  $T_0=6.4$ ,  $\epsilon=2.64$ ,  $\frac{r}{T_0^2}=0.034$ . Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
163	1	I	e M <sub>E</sub> F	<i>h. m. s.</i> 13 45 00 53 22 14 14	8-9		15	
164	2	Id	eP F	14 09 30 12				
165	3	Iv	eP L M <sub>N</sub> M <sub>E</sub> F	5 56 10 56 47 57 35 57 39 6 09	5 5	158	225	NW of Luzon.
166	5-6	I	e F	23 50 0 35				
167	6	I	e F	1 31 59				
168	6	I	e F	6 25 16 55				
169	6	IIv	eP L M <sub>N</sub> M <sub>E</sub> F	9 28 54 29 19 29 24 29 24 40	0.5 1	428	380	W of Luzon.
170	6	I	e L F	11 23 30 28 31 12 01				
171	6	I	e L M <sub>E</sub> F	15 07 11 28 14 46 53	11-12		12	
172	6-7	IIr	e	23 54 02				End overtaken by following earthquake.



## Records of the microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
173	7	Iv	eP M <sub>E</sub> M <sub>N</sub> F	h. m. s. 0 03 29 04 38 04 49 1 05	7 11	175	237	NE of Mindanao.
174	7	Iv	eP F	20 04 27 13				NE of Mindanao.
175	7	I	eP L M <sub>N</sub> M <sub>E</sub> F	20 50 01 52 35 53 07 53 56 21 28	13 8	30	27	
176	8	I	eP L M <sub>E</sub> F	5 38 40 39 54 41 25 58	13		28	
177	8	I <sub>a</sub>	eP L F	14 54 02 54 12 57				
178	8	Iv	eP L M <sub>N</sub> F	17 35 09 37 41 38 06 18 02	9	20		NE of Mindanao.
179	8	I	e F	18 46 22 19 29				
180	8	I	e F	19 33 20 02				
181	8-9	I	e F	23 50 0 10				
182	9	I	e F	14 05 25				
183	9	I <sub>r</sub>	eP L F	16 30 26 34 45 17 13				
184	9	I	e F	21 31 22 24				
185	10	I <sub>a</sub>	eP L F	10 40 43 40 51 44				
186	12	I	e L M <sub>E</sub> F	6 43 08 44 56 46 17 7 03	11		32	
187	13	I <sub>a</sub>	eP L M <sub>E</sub> F	23 05 47 06 07 06 11 10	1		100	
188	14	IIv	eP L M <sub>E</sub> F	9 07 43 08 04 08 07 28	1-2		1,762	SW of Luzon.
189	15	I <sub>a</sub>	eP F	23 51 03 53				
190	16	Iv	eP L F	12 00 32 01 11 05				Vigan (NW of Luzon).
191	16	I <sub>a</sub>	eP F	0 27 00 30				
192	17	Iv	eP S L M <sub>E</sub> F	10 28 07 30 32 33 24 84 33 11 14	8-9		25	NE of Mindanao.

## Records of the microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
193	17	Iv	eP L M <sub>N</sub> F	<i>h. m. s.</i> 22 23 12 23 40 23 55 29	1	38		Butuan (N of Mindanao).
194	18	IIr	eP F	2 14 26 3 07				
195	18	Iv	eP L M <sub>E</sub> F	20 55 00 57 19 59 29 21 19	8	17		
196	19	I	e F	11 54 12 16				
197	20	Ir	eP S L M <sub>E</sub> F	3 53 51 55 45 57 50 4 00 36 30	11	63		N of Luzon.
198	20	I	e F	10 30 58				
199	20	Iv	eP F	16 45 00 56				
200	21	I	e F	13 55 14 40				
201	25	I	eP eS eL M <sub>N</sub> M <sub>E</sub> F	10 22 58 24 35 27 11 28 08 28 27 54	8 6-7	11 15		N of Luzon. Maximum and end not recorded owing to the amplitude of the shock throwing the pens off the record.
202	29	I	e F	10 18 34 39				
203	29	IIIv	eP L	13 30 11 30 59				
204	30	IIr	eP S L M <sub>E1</sub> M <sub>N1</sub> M <sub>N2</sub> M <sub>E2</sub> F	11 54 30 12 00 32 06 12 07 28 07 48 14 18 15 47 14 03	21-22 14-15 13-14 12-13	295 189 125 107		

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

1, 4<sup>h</sup> 20<sup>m</sup> [1, 12<sup>h</sup> 20<sup>m</sup>]. Maasin (SW de Leyte). Temblor oscilatorio de intensidad II-III, duración 3<sup>s</sup>.

2, 11<sup>h</sup> 45<sup>m</sup> [2, 19<sup>h</sup> 45<sup>m</sup>]. NE de Mindanao. Temblor de tierra de intensidad III-IV en toda la península de Surigao. Éste y todos los demás sentidos en la misma región durante el mes de Mayo pueden considerarse como repeticiones correspondientes al período sísmico de Abril, si no se les señala diferente origen.

3, 5<sup>h</sup> 56<sup>m</sup> 10<sup>s</sup>\* [3, 13<sup>h</sup> 56<sup>m</sup> 10<sup>s</sup>]. NW de Luzón. Temblor de tierra de intensidad IV sentido en las Provincias de Ilocos Sur, Ilocos Norte, Unión y algo en la Provincia Montañosa. Su origen se hallaba cerca de las costas de Ilocos Sur.

3, 23<sup>h</sup> 35<sup>m</sup> [4, 7<sup>h</sup> 35<sup>m</sup>]. NE de Mindanao. Temblor de tierra de intensidad IV-V. Repitió con menos intensidad dos horas después.

4, 21<sup>h</sup> 10<sup>m</sup> [5, 5<sup>h</sup> 10<sup>m</sup>]. Nueva Cáceres (SE de Luzón). Temblor de tierra de intensidad II-III.

6, 9<sup>h</sup> 28<sup>m</sup> 54<sup>s</sup>\* [6, 17<sup>h</sup> 28<sup>m</sup> 54<sup>s</sup>]. W de Luzón. Temblor de tierra sentido en la Provincia de Pangasinán, y en la parte meridional de la Unión y Benguet: su intensidad no pasó sin embargo del grado III-IV y su duración apenas llegó a 2<sup>s</sup>. El epicentro parece se hallaba en la parte NE del Golfo de Lingayén.

7, 0<sup>h</sup> 03<sup>m</sup> 29<sup>s</sup>\* [7, 8<sup>h</sup> 03<sup>m</sup> 29<sup>s</sup>]. NE de Mindanao. Temblor de tierra de intensidad V-VI. Repitió tres veces con menor intensidad en el espacio de 50<sup>m</sup>.

7, 20<sup>h</sup> 04<sup>m</sup> 20<sup>s</sup>\* [8, 4<sup>h</sup> 04<sup>m</sup> 20<sup>s</sup>]. NE de Mindanao. Temblor de tierra de intensidad V, precedido y seguido de otras sacudidas de menos intensidad.

8, 17<sup>h</sup> 35<sup>m</sup> 09<sup>s</sup>\* [9, 1<sup>h</sup> 35<sup>m</sup> 09<sup>s</sup>]. NE de Mindanao. Temblor de tierra de intensidad IV-V.

14, 9<sup>h</sup> 07<sup>m</sup> 43<sup>s</sup>\* [14, 17<sup>h</sup> 07<sup>m</sup> 43<sup>s</sup>]. SW de Luzón. Temblor de tierra de intensidad III-IV sentido a lo largo de las costas de Zambales, Cavite y Batangas: su epicentro se hallaba en el Mar de la China a poco más de 120 kilómetros al WSW de Manila.

16, 12<sup>h</sup> 00<sup>m</sup> 32<sup>s</sup>\* [16, 20<sup>h</sup> 00<sup>m</sup> 32<sup>s</sup>]. Vigan (NW de Luzón). Temblor oscilatorio y susultorio, intensidad IV, duración 3<sup>s</sup>. Su origen parece ser el mismo que el del día 3, situado en el mar a poca distancia de las costas de Ilocos Sur.

17, 10<sup>h</sup> 28<sup>m</sup> 07<sup>s</sup>\* [17, 18<sup>h</sup> 28<sup>m</sup> 07<sup>s</sup>]. NE de Mindanao. Temblor de tierra de intensidad V-VI sentido en toda la península de Surigao y parte N del Valle del Agusan. Repitió con menos intensidad a 13<sup>h</sup> 05<sup>m</sup> [21<sup>h</sup> 05<sup>m</sup>].

18, 20<sup>h</sup> 55<sup>m</sup> 00<sup>s</sup>\* [19, 4<sup>h</sup> 55<sup>m</sup> 00<sup>s</sup>\*]. Butuan (N de Mindanao). Temblor oscilatorio, dirección S-N, intensidad IV, duración 10<sup>s</sup>.

20, 16<sup>h</sup> 45<sup>m</sup>\* [21, 0<sup>h</sup> 45<sup>m</sup>]. NE de Luzón. Temblor oscilatorio, dirección N-S, intensidad III: sentido en la parte norte de Ilocos Norte, Cagayán y Provincia Montañosa.

29, 13<sup>h</sup> 30<sup>m</sup> 11<sup>s</sup>\* [29, 21<sup>h</sup> 30<sup>m</sup> 11<sup>s</sup>]. N de Luzón. Temblor de tierra de intensidad VI-VII, sentido principalmente en las Provincias de Ilocos Norte y Sur y en la parte N de la Provincia Montañosa y de Cagayán. El área meizoséismica comprendía, según los datos de que disponemos, toda la Provincia de Ilocos Norte, la parte N de la Provincia Montañosa y NW de Cagayán. Llamó mucho la atención en ambos Ilocos el fuerte ruido subterráneo procedente al parecer de hacia el E que precedió a los primeros choques sensibles; la duración del terremoto no bajó en ninguna parte de 30<sup>s</sup>. A juzgar por las

<sup>1</sup> La intensidad de los terrenos se indica conforme a la conocida escala de De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.

diferentes intensidades del fenómeno en Ilocos y en las estaciones de la Provincia de Cagayán su epicentro debe colocarse dentro de la isla, hacia la Cordillera central, no lejos del paralelo  $18^{\circ}$  N, región habitada solamente por tribus infieles de donde es imposible obtener datos. No es sin embargo probable que tuviese allí mucha mayor intensidad que la experimentada en las vecinas Provincias de Ilocos y Cagayán, y si la tuvo, debió ser en un área muy reducida, a juzgar por la distancia de sólo 170 kilómetros a que fué perceptible hacia el S. Registráronlo los seismógrafos no sólo de Filipinas sino también los del Extremo Oriente. A  $20^h 25^m$  [ $30, 4^h 25^m$ ] se experimentó una repetición de intensidad III-IV perceptible tan sólo dentro de una distancia de 70 kilómetros del epicentro.

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## BULLETIN FOR JUNE, 1913.



# METEOROLOGICAL BULLETIN FOR JUNE, 1913.

By Rev. JOSÉ CORONAS, S. J.,

Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

Pressure and temperature.—The mean atmospheric pressure of the month was greater than that of the previous year in all the stations of the Philippines, the greatest differences being +1.28 and +1.48 mm. in Aparri and Tuguegarao, respectively, both stations being in the northeast of Luzon.

In Manila the mean differed from the June normal by +0.68 mm. The highest pressure was registered on the 19th in almost all parts of the Archipelago, and the lowest on the 5th.

The mean monthly temperature was lower than in June, 1912, the greatest difference being  $-1.5^{\circ}$  C. in Tacloban. The extremes for Manila were  $36.5^{\circ}$  C. registered on the 4th, and  $22.6^{\circ}$  C. on the 1st.

### PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR JUNE, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from June, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from June, 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		$^{\circ}$ C.	$^{\circ}$ C.	$^{\circ}$ C.		$^{\circ}$ C.	
Tagbilaran <sup>a</sup>	758.67		760.13	29	756.60	5	27					
Surigao <sup>b</sup>	58.55		59.97 <sup>c</sup>	19	56.85	5	26.9					
Cebu	58.72	+0.68	60.12	19	56.72	5	28.3	-0.7	33	30	22.5	16
Iloilo	58.42	+ .44	59.94	19	56.28	5	27.5	-1	33.7	4	22.6	28
Ormoc	58.80	+ .42	60.26	19	56.78	5	27.1	- .3	34.9	2	21.2	25
Tacloban	58.86	+ .62	60.31	29	56.99	5	27.3	-1.5	33	23	22.8	27
Capiz	58.60	+ .71	60.23	19	56.28	5	27	-1.2	33.7	24	22.2	14
Calbayog	58.68	+ .50	60.10	19	56.76	5	26.8	-1.3	33.4	2, 19	22.2	27
Legaspi	58.76	+ .84	60.22	19	56.88	5	28.4	- .7	35.6	23	21.4	27
Atimonan	58.46	+ .88	60.05	19	56.34	5	27.7	-1	34.3	14, 24	22.6	20
Ambulong, Tanauan	58.25		60.07	19	56.14	5	27.6		35.5	16	22.4	20, 30
Paracale	58.85	+1.11	60.50	19	56.78	5	27.7	-1.3	34.6	10	22.1	4
Manila	58.65	+ .76	60.49	19	56.47	5	27.8	- .9	36.5	4	22.6	1
San Isidro	58.75	+ .75	60.48	19	56.72	5	27.9	- .4	37.2	3	21.9	2
Dagupan	57.95	+ .65	59.68	19	55.88	5	28.5	0	37.4	2	22.6	28
Bolinao	58.10	+ .81	59.83	19	56.06	5	27.9	- .5	35.2	2	23	29
Baguio <sup>c</sup>	636.72	+ .52	638.16	19	635.15	5	18.9	- .1	26.3	1	14.8	29
Vigan	758.24	+ .88	759.90	19	756.25	5	27.7	-1	33.7	1, 2	22.5	10
Tuguegarao	58.43	+1.28	60.26	19	56.23	5	28.5	- .6	40.3	3	22	19, 25
Aparri	58.23	+1.48	60.13	19	55.86	5	28	- .3	34.5	3	22.1	19

<sup>a</sup> 25 days of observation only.

<sup>b</sup> 27 days of observation.

<sup>c</sup> The barometric readings of this station are not reduced to sea level.

Rainfall.—From the following table it will be seen that only 19 of the 47 stations had less rain than last year. Nevertheless, of the 24 stations for which the difference between the total of the month and the June normal is given only ten have a greater amount than the normal, the other 14 having less. The amount of rain registered in Manila during the month was 195.8 mm., which is greater than last June by 99.4 mm. and less than the normal of the month by 37.3 mm.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF JUNE, 1913.

Station.	Total.	Departure from June, 1912.	Departure from normal.	Rainy days.	Departure from June, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from June, 1912.	Departure from normal.	Rainy days.	Departure from June, 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.		mm.				mm.	mm.	mm.		mm.		
Jolo <sup>a</sup>	354.9							Sumay, Guam	68.6	+ 6.5		15			12
Isabela, Basilan	258.9	- 70.4		23	0	69.3	10	Calapan	148.3	+ 62.1		17	+ 9	31.5	28
Zamboanga	124	+ 65.6	+ 22.9	15	+ 7	35.6	30	Virac	196	+ 122.7		18	+ 6	64.2	25
Davao	215.6	+ 117.5	- 13.4	16	+ 8	53.8	6	Nueva Caceres	212.4	+ 113.3	+ 42.6	17	+ 10	62.2	30
Cotabato	250.4	+ 28.3	- 1	23	+ 7	50	9	Batangas	19	- 29		8	0	10.9	24
Cagayan, Misamis	132.2			15		37.3	6	Atimonan	171.2	+ 24.6	+ 22.3	17	+ 7	31.2	25
Butuan	219.2	+ 132.4	+ 72.2	23	+ 9	40.9	26	Ambulong, Tanauan	205.9			12		50.1	26
Dumaguete	197.4	+ 70.2		14	+ 8	72.4	2	Silang	141.9	- 72.6		12	+ 2	35.1	27
Yap, W. Carolines	87.4	- 57.3		16	- 1	21.1	5	Sta. Cruz, Laguna	184.7	+ 110.3		19	+ 7	51.3	4
Tagbilaran <sup>b</sup>	41.8					18?	30?	Paracale	151.9	+ 43.4		11	- 3	42.2	4
Surigao <sup>c</sup>	131.9					66.3?	2?	Manila	195.8	+ 99.4	- 37.3	14	+ 3	41.7	12
Maasin	45.4	- 73.5	- 96.4	4	- 2	21.8	2	Antipolo	228.6	+ 96.4		12	+ 2	52.8	17
Cebu	235.5	+ 71.9	+ 61.7	15	- 1	64.5	30	Iba	313.2	- 7.5		16	- 5	117.3	28
Iloilo	156.1	+ 37.6	- 44	15	- 4	60	6	San Isidro	175.5	- 72.8	- 25.5	17	- 2	40.3	28
San Jose Buenavista	181.7	- 29		19	- 5	52.8	7	Tarlac	276.6	- 87.5	+ 54.5	16	- 4	64.8	17
Cuyo	154.4	- 6.4		14	- 5	41.4	10	Baler	108.9	- 34.9		16	+ 6	31.7	16
Ormoc	82.5	- 124.9	- 94.7	13	- 2	30.9	25	Dagupan	188.6	+ 6.6	- 129	15	+ 1	56.9	28
Guiuan	241.9	+ 141.6		20	+ 7	54.9	28	Bolinao	362.3	+ 137	- 33.4	20	0	88.4	10
Tacloban	154.8	+ 99.6		17	+ 9	21.3	13	Baguio	406.5	- 58.7	+ 3.1	25	0	80.2	6
Capiz	174.3	+ 14.8	- 123.4	22	+ 4	46.4	14	San Fernando, Union	315.7	+ 145.8?	+ 23.9	19	+ 4	106.2	18
Borongan	133.8	+ 22.5	- 103.1	20	+ 8	33	26	Echague	70.8	- 240.8		9	- 10	19.8	23
Calbayog	60.7	- 93.6	- 86.2	17	+ 3	11.7	2	Candon	445	+ 143.4		19	+ 3	98.8	28
Masbate	34	- 179.7		9	- 6	19.9	23	Vigan	498.6	+ 336.3	+ 201.4	22	+ 4	79.8	17
Romblon <sup>d</sup>	207.7							Tuguegarao	95.9	+ 35.6	- 28.1	16	- 10	21.6	6
Batag	83.5			10		31	28	Laoag	282.8	+ 163		16	+ 2	45.7	10, 15
Gubat	53.7	+ 23.9		11	+ 8	17.8	14	Aparri	124.1	- 40	+ 2.8	9	- 3	70.4	28
Legaspi	56	- 44.6	- 118.3	9	+ 2	31.7	27	Sto. Domingo, Batanes	59	- 136		11	- 3	25.9	5

<sup>a</sup> 22 days of observation.<sup>b</sup> 25 days of observation.<sup>c</sup> 27 days of observation.<sup>d</sup> No rain gauge from 1st to 13th.

## DEPRESSIONS AND TYPHOONS.

This year was one of the very rare occasions in which during the month of June it has not been necessary for the Observatory to announce a typhoon or depression in the Philippines or in the neighboring seas. Nevertheless, the continental depressions which moved from China toward Japan were fairly frequent, but, as is well known, these depressions have scarcely any importance for the Islands.



## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes es para todas las estaciones de Filipinas mayor que la del año pasado, correspondiendo las diferencias mayores +1.28 y +1.48 mm. a Aparri y Tuguegarao, en la parte nordeste de Luzón. La media mensual de Manila difiere de la normal de Junio en +0.68 mm. Las mayores presiones se registraron casi en todo el Archipiélago el día 19, y las menores ocurrieron sin excepción alguna el día 5.

La temperatura media mensual resulta algo menor que la de Junio, 1912, siendo la diferencia más notable  $-1.5^{\circ}\text{C}$ . correspondiente a la estación de Tacloban. Las temperaturas extremas para Manila fueron  $36.5$  y  $22.6^{\circ}\text{C}$ ., habiéndose registrado la primera el día 4, y la segunda el día 1.º

**Precipitación acuosa.**—Examinando la tabla de lluvia que acompaña el texto inglés, hallamos que de 47 estaciones 19 solamente obtuvieron este mes un total de lluvia menor que el año pasado. Sin embargo, de 24 estaciones para las cuales damos las diferencias entre estos totales y los valores normales de Junio, 14 aparecen con una cantidad menor y solas 10 con una cantidad mayor. La cantidad de agua recogida en los pluviómetros de Manila durante este mes ha sido 195.8 mm, diferenciándose de la de Junio, 1912, en +99.4 mm. y de la normal de este mes en  $-37.3$  mm.

## DEPRESIONES Y TIFONES.

Pocas veces sucede, como ha sucedido este año, que se pase todo el mes de Junio sin que el Observatorio haya de anunciar ningún tifón o depresión en Filipinas o cuando menos en los mares próximos a Filipinas. En cambio, han sido bastante frecuentes las depresiones continentales que se han movido desde China hacia el Japón o los alrededores de Japón. Mas, como es sabido, estas depresiones apenas son de importancia ninguna para nuestro Archipiélago.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied,  $-1.72$  mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.			Free exposure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.				
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.
1	758.29	28.6	35.5	22.6	30.5	31.2	30.8	31	30	29	67.2	19.3	6.8	5.1
2	58.14	28.3	35.5	22.7	30.5	32.2	30.8	31	30	29	69.8	19.8	5.4	4.2
3	57.53	28.6	34.9	23.1	31	32.5	31	31.2	30	29.1	71.7	20.6	5.5	4.1
4	57.25	28.7	36.5	24	31	33.3	31.2	31.5	30	29	76.4	21.9	4.9	3.7
5	56.47	28.2	35	23.9	31	33.5	31.4	31.6	30	29.1	78.6	22.1	5.1	3.2
6	57.22	27.8	34	23.8	30.5	31.8	31.4	31.6	30	29	82.5	22.6	3.6	2.6
7	57.45	28.3	33.5	24.3	30.5	32.3	31.2	31.6	30.1	29.2	74.8	21.1	5.9	3.9
8	57.84	28.5	34.5	23.8	30.6	33	31.5	31.8	30	29.1	75.6	21.7	5.5	4.3
9	58.36	28	35.1	23.4	31.5	33.2	31.8	31.9	30.3	29.2	75.8	20.9	4.9	3.6
10	58.66	27.1	34.7	23.4	31.4	33.3	31.8	32	30.1	29.4	84	22.1	2.9	2.5
11	58.49	28.1	34.2	23.7	30.3	32.2	31.5	31.8	30.1	29.3	79.9	22.2	4.6	3.5
12	58.26	28	34.7	23.4	30.4	32.6	31.5	31.8	30.2	29.2	76.9	21.2	4.4	3.4
13	58.44	28.1	34.8	24.2	30.4	32.1	31.5	31.7	30.2	29.2	80.8	22.6	4.3	3
14	58.26	28.2	35.2	24	30.5	32.2	31.5	31.8	30.2	29.2	77.6	21.8	4.1	3.5
15	58.31	28.2	34.2	24.3	30.5	32.1	31.4	31.7	30.2	29.3	79.6	22.4	4.4	3.1
16	57.96	27.9	34	24.6	30.9	32.3	31.7	31.9	30.3	29.3	82.1	22.6	3.6	2.9
17	58.60	27.6	32.8	23.3	30.8	31.8	31.6	31.6	30.2	29.3	84	22.8	3.5	2.7
18	59.50	27.3	34.2	23.2	30.3	31.7	31.4	31.9	30.3	29.3	84.6	22.6	2.9	2.3
19	60.49	26.7	33.5	23.5	30.3	31.2	31.2	31.4	30.2	29.2	83.8	21.7	2.8	2
20	59.93	27.4	33.2	22.9	30	31.3	31.2	31.2	30.3	29.2	80.8	21.7	3.5	2.6
21	58.99	28.3	33.6	23.5	30.4	31.5	31.2	31.1	30.3	29.2	79.7	22.6	5.3	3.2
22	59.06	28.8	33.5	25	30.9	31.8	31.4	31.6	30.4	29.2	80.8	23.4	4.8	3.3
23	59.42	28.2	33.9	25	31.2	32.5	31.6	31.8	30.3	29.3	81.4	23	3.8	2.6
24	59.46	27.6	33.6	24.3	31	32.3	31.8	31.8	30.3	29.3	83	22.6	3.3	2.3
25	59.74	26.6	32	24.1	30.8	31.5	31.8	31.8	30.3	29.3	87.6	22.6	1.5	1.4
26	59.36	27.2	33.7	23	30.9	31.4	31.4	31.5	30.3	29.2	81.9	21.7	3.8	2.8
27	59.05	26.5	34.1	23.3	30.2	31.6	31.3	31.5	30.4	29.2	86.5	22	2.4	1.8
28	60.16	26.3	32.9	23	30	31.6	31.1	31.4	30.4	29.2	85.1	21.4	2.7	2.2
29	60.15	27.7	33.5	23.4	30.1	31.5	31.1	31.3	30.4	29.3	81.2	22.2	3.5	3
30	58.72	27.1	33.8	24.4	30.3	31.8	31.1	31.4	30.4	29.3	82.3	21.8	3.4	2.5
Mean Total	758.65	27.8	34.2	23.7	30.6	32.1	31.4	31.6	30.2	29.2	79.9	21.9	4.1 123	3 91.3
Departure from normal	+ 0.68	- 0.1	+ 1.8	- 0.2							- 1.0	- 0.5		

Day.	Wind.				Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.
	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.		Form and its direction.				
						Upper.	Lower.			
		Km.	Km.		0-10.			h.	m.	mm.
1	E quad.	194.5	20	SE	3.9	Ci.	Cu.	E	8 50	
2	Variable	196.5	19	NW	3.8	Ci.	Cu.	E	7 40	↑ p.
3	WNW	180	16.5	WNW	6.2	Ci.-S.	Cu.	E	8 05	
4	SE, WSW	236.5	22	WSW	6.2	Ci.	Cu.	E	7 25	0.8 [↘ d p.
5	NE, WSW	174	23	WSW	6.8	Ci.	Cu.	SSE	7 45	27.5 [↘ d p.
6	S quad.	128.5	12	S	9.6	Ci.-S.	Cu.-N.	SE	2 50	1.3 [↘ a. f d p.
7	SE	216	18	ESE	7.9	A.-Cu.	Cu.	ESE	5 05	
8	SE	195	20	SE	5.6	Ci.	Cu.	SEbyE	7 05	
9	NNE	242	22	SSW	4.3	Ci.	Cu.	ESE	7 15	[↘ p.
10	Variable	131.5	17	SSE	8.5	Ci.	Cu.	E	4 15	12.7 [↘ d p.
11	SE	172.5	13.5	SE	9.1	Ci.	Cu.	SSE	5 20	
12	SE	212	18.5	SSE	7.4	Ci.	Cu.	ESE	6 55	41.7 ● 2 p.
13	SE	216	26	SW	6	Ci.	Cu.	ESE	7 15	[↘ p.
14	SE quad.	251	29	SWbyW	5.1	Ci.	Cu.	ESE	7 00	2.1 ↑ p.
15	SE, WSW	251	22	WSW	8.6	Ci.-S.	Cu.-N. SSE	ESE	5 15	d a. f d a. p
16	W quad.	218	27	WSW, S	6.6	Ci.	Cu.	SE	7 05	32.3 [↘ p.
17	SW	261	21	WSW	5.7	Ci.	Cu.	SE	7 30	36.5 ● a. f d p.
18	ENE, SE	177	19	WSW	8.6	Ci.-S.	Cu.	SSE	4 20	18.3 ● 2 a. f p.
19	Variable	126.5	12	SW	8.8	Ci.-S.	Cu.-N.	E	4 25	3.3 ↑ p.
20	W quad.	198.5	21	SWbyW	6.2	Ci.	Cu.	E	6 05	2 ● p.
21	SW, WSW	220.5	20	WSW	3.7	Ci.	Cu.	ESE	9 05	∞ p.
22	WSW	265.5	26	WSW	3.5	Ci.	Cu.	SSE	9 15	∞ a. f d p.
23	W quad.	213	24.5	WSW	4.5	A.-Cu.	Cu.	E	6 50	↑ d p.
24	W quad.	142	18	SW	6	Ci.	Cu.	NW	5 50	↑ p.
25	WNW, SE	98.5	12	WNW	8.9	Ci.-S., A.-Cu.	Cu.-N.	ESE	1 00	4.5 ● a. p. ↑ p.
26	W quad.	135.5	18	WNW	7.8	Ci.	Cu.	E	6 00	
27	E quad.	141.5	13	W	8.6	Ci.	Cu.	ESE	4 50	4.1 [↘ p.
28	SE, ENE	182	18.5	SbyE	8.6	Ci.-S.	Cu.	E	4 25	8.7 [↘ p.
29	SE	143.5	13	SE	8.6	Ci.-S.	Cu.	E	4 40	
30	N	170.5	14	WbyN	7.2	Ci.	Cu.	ESE	5 50	↑ p.
Mean Total		189.7 5,690.5	19.2		6.7				6 10 185 10	195.8
Departure from normal		-1,125.1			-0.2				+10 57	-37.3

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.

METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.<sup>a</sup>

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 8 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.	Upper.	Lower.	
1.	757.36	27.2	31	23.4	85	22.7	SE	0.7	4.2	Ci.	Cu. SSE	
2.	57.41	27.7	32.4	23.6	83.7	22.8	Variable	.8	4.5	Ci.	Cu. E	2.6
3.	57.52	26.4	30.3	22.7	87.3	22.2	SE quad.	1	7.8	Ci.-S.	Cu. SE	1.3
4.	57.24	27.8	32.5	23.6	82.8	22.6	SE	1.2	3.8	Ci.	Cu. SE, S	7.5
5.	56.60	27.2	31	24.3	87.3	23.2	S, SE	.7	5.3	Ci.	Cu. S	7
6.	57.18	26.7	30.3	23.3	87.7	23.6	S	1.3	7.5	Ci.-S.	Cu. SSW	7
7.	57.19	27	30.6	23.2	87.2	23	SSE, S	1.2	5.8	Ci.-S.	Cu. SSW	.5
8.	57.71	26.9	31.4	23.6	87.7	22.8	S	1	2.8	Ci.	Fr.-Cu. Variable	
9.	58.34	27.3	31.4	23.3	83.5	22.2	S	1.3	2.5	Ci., Ci.-S.	Cu. S	
10.	59	27	30.9	23.4	83.7	21.9	S	1.3	2.7	Ci.	Cu. SW	
11.	58.82	26.6	30.3	23.3	87.8	22.6	S	.7	8.2	Ci.-S.	Cu. S	
12.	58.68	27.5	32.3	22.5	82.3	22.2	NE	.7	5	Ci.-S.	Cu. E	
13.												
14.												
15.												
16.												
17.												
18.	59.71	26.1	32.7	23.4	92	23.1	E, S	.7	6	Ci.	SE	2
19.	60.10	27.3	32.2	23.2	84.7	22.6	S	.8	2.8	Ci.	Cu. SSE, SSW	
20.	59.63	27.3	32.7	23.7	85.2	22.8	SSE, SE	.8	4.3	Ci.	Cu. ESE, SE	
21.	59.28	27.7	32.6	24.1	85.3	23.3	SE	.7	6.5	Ci.-S.	Cu. E	
22.	59.46	27.8	32.8	24.2	87.5	24	SE, S	.7	3.5	Ci.	Cu. E	.8
23.	59.75	27.3	32.6	23.8	90.2	24.2	S	.8	5.2	Ci.	Cu. S quad.	
24.	59.63	25.7	29.9	23	92	22.4	S	.7	6.8	Ci.-S.	Cu. S	
25.	59.70	26.1	31.2	21.7	84.2	21.1	S quad.	1	4.3	Ci.	Cu. ENE	2.1
26.	59.07	26.5	31.7	22.8	86.8	22.3	NE	1.5	3.7	Ci.	Cu. E	
27.	59.03	26.8	31.8	22.6	91	23.8	Variable	1.2	4	Ci.-S. Ci.	Cu. E	
28.	59.74	27.2	33.4	23.3	88	23.4	SE quad.	.5	5.8	Ci.-S.	Cu. E	
29.	60.13	26.8	32	22.7	88.5	23	S	1.2	2.7	Ci.	Cu. SE	
30.	58.48	26.1	33.2	22.9	94	23.5	S	.8	4.3	Ci.	Cu. SE	18
Mean	758.67	27	31.7	23.3	87	22.8		.9	4.8			
Total												b41.8

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	757.32	26.8	31.1	24	81	21.2	E quad.	244.6	9	Ci.-S.	Cu.-N. ESE	8.9
2.	57.64	26.2	31.8	23.9	85.5	21.6	E	144.7	6	Ci.-S.	Cu.-N. ESE	66.3
3.	57.55	27	31	23.1	79.5	21	E quad.	163.6	7.3	Ci.-S.	Cu.-N. ESE	1.5
4.	57.35	27	31.1	24	80.5	21.2	E quad.	208.7	6.3	Ci.-S.	Cu.-N. SE	2.3
5.	56.85	27.5	30.4	24.4	79.8	21.7	E	271.7	3.8	Ci.-S.	Cu. SE	4.1
6.	57.21	26.8	30.2	23.9	82.3	21.5	E	178.9	5.8	Ci.-S.	Variable	1.5
7.	57.28	27.1	30.9	24	83.2	22	E	204.4	4.7	Ci.-S.	Cu. ESE	1.8
8.	57.75	26.6	29.9	23.1	81.8	21	E	238.9	5.8	Ci.-S.	Cu.-N. ESE	
9.	58.39	27.2	31	23	80.2	21.2	E	168.5	4	Ci.-S.	Cu.-N. ESE	
10.	58.66	27.4	32.9	22.9	79.2	21.3	E	152.9	2.8	Ci.-S.	Cu.-N. ESE	
11.	58.76	27.2	31.8	23.1	80.3	21.3	E	156.5	3.8	Ci.-S.	Cu.-N. ESE	
12.	58.58	27.2	30.9	23.7	81.3	21.6	E	118.7	5.2	Ci.-S.	Cu.-N. ESE	6.6
13.	58.76	26.7	30.9	23.3	83.3	21.6	E	131.2	4.2	Ci.-S.	Cu.-N. ESE	1.8
14.	58.68	26.5	31.6	23.1	82.8	21.2	E		5	Ci.-S.	Cu.-N. SE	
15.	58.50	26	29.9	23	83.8	21	E		4.7	Ci.-S.	Cu.-N. SE	
16.	58.47	26.6	32.4	23.5	80	20.5	W	168.9	5.8	Ci.-S.	Cu.-N. SE	3.6
17.	58.93	26.8	31.7	22.2	80.7	20.8	E	107.6	4.8	Ci.-S.	Cu.-N. SE	
18.	59.50	26.8	32.5	22.9	81.3	21.3	SW, E	127.5	5	Ci.-S.	Cu.-N. SE	
19.	59.97	27.4	32.5	23	79.2	21.2	E quad.	175.6	3.5	Ci.-S.	Cu.-N. SE	
20.	59.52	27.8	32.1	23.7	79.5	21.8	E quad.	134.3	3.3	Ci.-S.	Cu.-N. SE	
21.	59.17	27.2	32	23.8	81.5	21.8	E	94.6	4.7	Ci.-S.	Cu.-N. SE	
22.	59.22	27.8	33.9	23	78.7	21.6	E, ENE	100.2	4	Ci.-S.	Cu.-N. SE	
23.	59.60	27.6	32	23.7	77.8	21.2	NW	146.3	4.2	Ci.-S.	Cu.-N. SE	
24.	59.85	25.1	30	22	84.2	19.9	E	133.3	6.3	Ci.-S.	Cu.-N. SE	20.6
25.	59.88	24.3	30.7	20.9	84.5	19	E quad.	186.2	6.2	Ci.-S.	Cu.-N. SE	11.4
26.	59.06	26.8	30.4	22.7	79.8	20.8	NW, E	197.9	4.5	Ci.-S.	Cu.-N. SE	
27.												
28.												
29.												
30.	58.30	27.8	31.5	23.8	79	21.6	E quad.		4	Ci.-S.	Cu.-N. SE	
Mean	758.55	26.9	31.4	23.2	81.1	21.2		164.8	5			
Total												131.9

<sup>a</sup> All the mean values given in these tables are deduced from six daily observations.<sup>b</sup> 26 days of observation only.

## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	757.57	28.4	32	23.9	74.3	21.1	NE, N	362.8	3.7	Ci., A.-Cu.	Cu.	E
2.	57.68	29.2	32.7	26.5	67.5	20.1	NE	356.9	4.2	Ci.	Cu.	E
3.	57.54	27.2	29.5	23.9	73.7	19.6	NE, N	265.5	7.5	Ci.-S.	Cu.	E
4.	57.31	28.4	31.5	25	75.2	21.5	NE	268.9	4.3	Ci.	Cu.	E
5.	56.72	28.7	31.1	26.2	75.7	22	NE	308.5	3.7	Ci.	Cu., S.-Cu.	E
6.	57.32	28.6	32	26.9	73.8	21.4	E, NE	264.5	5.2	Ci.-S.	S.-Cu.	E
7.	57.25	28.5	31.8	25.4	73.5	21	NE	298.7	5	Ci.	Cu.	E
8.	57.87	28.4	31.6	25.3	77	21.9	NE	278.4	3.8	Ci.	Cu.	E
9.	58.32	28.6	31.3	26	72	20.9	NE	259.1	2.5	Ci.	Cu.	E
10.	58.81	28.8	31.5	25.6	69.7	20.4	Variable	243	3.3	Ci., Ci.-S.	Cu.	E
11.	58.78	27.9	30.4	26	77.5	21.6	Variable	156.4	5.5	Ci.-S.	Cu.	E
12.	58.76	28.7	32	25.5	71.7	20.8	NW, NE	211.6	3	Ci.	Cu.	E
13.	58.86	28.6	31.9	26.2	73	21.2	NE quad.	197.2	6	Ci.-S.	Cu.	E
14.	58.83	28.8	32.5	26.2	74.8	21.9	E quad.	292.9	5.3	Ci.	Cu.	E
15.	58.49	28.3	32	25.7	76.2	21.8	Variable	204.5	6	Ci.-S.	Cu.	E
16.	58.78	26.3	30.2	22.5	84.3	21.4	SW quad.	311.1	7.3	Ci., Ci.-S.	Cu.	WSW
17.	59.03	28.1	31.5	26	77.3	21.6	S	225.4	5.7	Ci.	Cu.	SW
18.	59.67	28.1	31.2	24.9	75.8	21.3	S	152.9	4.3	Ci.	Cu.	SW, E
19.	60.12	28.7	32.8	25.6	73	21	N	225.1	3.2	Ci.	Cu.	E
20.	59.56	28.7	32.5	24.5	75.7	22	S	178	3.7	Ci.	Cu.	E
21.	59.25	28.4	32.5	24.5	75	21.4	S	175	7	Ci.-S.	Cu.	E
22.	59.39	28.6	31.6	26.3	75.2	21.8	SW quad.	225.6	4.2	Ci., Ci.-S.	Cu.	E
23.	59.68	28.5	31.5	26	78	22.5	SW quad.	306	4	Ci.	Cu.	E
24.	59.82	26.9	31	24.5	80.8	21.3	Variable	189.5	6.3	Ci.-S.	Cu.-N.	E
25.	59.74	27.3	32	23.9	77.8	20.8	Variable	300.9	3.5	Ci.	Cu.	E
26.	59.08	28.4	31.9	24.5	72	20.4	NE, N	249.1	4	Ci.	Cu.	E
27.	58.98	28.6	31.1	25.7	73	21.2	N, NE	245.5	3.8	Ci.	Cu.	E
28.	59.88	28.1	31.5	25.5	80.2	22.6	N, NNE	190.5	7.3	Ci.-S.	Cu.-N.	E
29.	59.94	28.2	31.5	25.6	74.8	21.2	N	184.2	3.5	Ci., Ci.-S.	Cu.	E
30.	58.46	27.8	33	23.2	76.8	21	Variable	247.9	5.2	Ci.-S.	Cu.-N.	E
Mean	758.72	28.3	31.7	25.2	75.2	21.3		245.9	4.7			
Total								7,375.6				235.5

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	757.19	28.7	32.6	25.4	71.7	20.7	N	475.9	4.3	Ci.	Cu.	
2.	57.24	28.9	33	25.5	74.3	21.7	N, NE	410	5	Ci.	Cu.	NE
3.	57.35	26.2	28.6	23.2	83.2	21	NE	267.9	9	Ci.-S.	Cu.-N., Cu.	E
4.	56.95	28.4	33.7	24.3	74.8	21.1	NE	182	5.3	Ci., Ci.-S.	Cu.	E
5.	56.28	27.9	32.5	24.6	78.5	21.6	NE	213.6	8.5	Ci.	Cu.-N., Cu.	E
6.	56.98	26.7	29.9	23.3	87.8	22.8	NE	187.5	9.8	Ci.-S.	Cu.-N.	E
7.	56.80	27.3	31.6	23.8	81.5	21.8	N, NE	202.9	6.7	Ci., Ci.-S.	Cu.	E
8.	57.39	28.6	33	25.4	76.5	22	N quad.	202.6	4.5	Ci.	Cu.	E
9.	58.01	28.4	33.1	24.5	75	21.2	NE quad.	177.3	5.7	Ci.	Cu.	E
10.	58.43	28.1	31.7	22.9	78.7	22.1	SW	228.3	7.2	Ci.	Cu.	NE
11.	58.60	27.1	30	24.8	83.5	22.1	SW	123.6	8.7	Ci.-S.	Cu.	E
12.	58.32	28.1	32.3	24.6	77.3	21.7	Variable	136.5	5.2	Ci.	Cu.	E
13.	58.85	27.1	30	24.4	83.8	22.2	W quad.	170.1	8.8	Ci.-S.	Cu.	E
14.	58.48	27.7	33	23.2	77.7	21.3	SW	170.2	7.2	Ci.-S., Ci.	Cu.-N.	E
15.	58.42	26.9	31	23.8	83.7	22	SW	192.2	9.2	Ci., Ci.-S.	Cu.	E
16.	58.48	26.4	29.3	23.9	87.7	22.3	SW, N	184.6	10	Ci.-S.	Cu.-N.	E
17.	58.74	26.8	30.4	23.9	80.7	21.1	SW quad.	173	7.7	A.-Cu.	ESE	E
18.	59.45	27.8	32	24	77.7	21.3	SW quad.	142.4	4.8	Ci.	Cu.	E
19.	59.94	27.2	31.3	24.3	80.7	21.5	Variable	127.4	7.3	Ci.	Cu.	SE
20.	59.47	27.2	32.5	24.3	78.2	20.8	N quad.	147.6	6.5	Ci.	Cu.	E
21.	59.15	27.8	32	24.4	77	21	NW	125.9	8.3	Ci., Ci.-S.	Cu.	E
22.	59.11	27.4	30.8	24.5	81.7	22.1	NW, SW	162	8	Ci.-S.	Cu.-N.	E
23.	59.54	27.2	31	23.6	80.2	21.4	SW	221.3	5.7	Ci.	Cu.	E
24.	59.36	27.2	31.4	24.4	78.5	21	NW	140.8	5.8	Ci.	Cu.	E
25.	59.21	27.6	31.8	24	77.5	21.1	N, NE	256.6	7.7	Ci.-S.	Cu.	E
26.	58.66	27.3	31.8	24.3	77	20.6	N, NE	288.8	7.7	Ci.	Cu.	E
27.	58.72	27.3	32	24.4	78.7	20.9	Variable	174.8	6.3	Ci.	Cu.	E
28.	59.69	26.5	31.9	22.6	83.8	21.3	Variable	147.2	9	Ci.-S.	Cu.-N., Cu.	E
29.	59.76	27	31.9	22.8	79.8	21	N	190.8	7.2	Ci.	Cu.	E
30.	58.17	27.9	32.5	25	75.2	20.8	N, NE	214	5.2	Ci.	Cu.	E
Mean	758.42	27.5	31.6	24.1	79.4	21.4		201.3	7.1			
Total								6,037.8				156.1

**ORMOC.**

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied,  $-1.83$  mm.]

Day.	Pressure (mean).			Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Amount (mean).	Form and its direction.						
										Upper.	Lower.					
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.		
1.	757.72	28.4	34.4	23.5	74	20.9	Variable	195.5	6.7	A.-Cu.	E	Cu.-N.	E		∠ p.	
2.	57.73	28.6	34.9	23.8	75.2	21.6	NE quad.	181.7	6	Ci.-S.		Cu.-N.	E	17.3	∠ p.	
3.	57.72	27.9	31.8	23.6	77.7	21.4	E quad.	134.1	9	Ci.-S.		Cu.-N.	E	3	● a. ∠ a. p.	
4.	57.46	27.3	31.5	24.2	84.8	22.8	E quad.	129.9	7.5	A.-Cu.	ESE	Cu.-N.	E	7.7	d ∠ a. ∠ p.	
5.	56.78	28.4	33.1	24	77.7	22.2	SE, N	212.1	5.2	Ci.-S.		Cu.	E		∠ p.	
6.	57.35	28.1	32.1	24.8	75.7	21.3	E	175.5	7.5	A.-Cu.	E	Cu.-N.	E	2.8	p a. ∠ p.	
7.	57.31	27.4	32.5	23.1	80.3	21.5	Variable	171.8	6.2	A.-Cu.	N	Cu.-N.	E		d a. p. ∠ p.	
8.	57.91	27.4	32.6	22.7	78.8	21	SE	225.6	5.2	A.-Cu.	E	Cu.-N.	ENE		d a. ∠ p.	
9.	58.42	26.9	32.1	22.1	79.7	20.7	NE	210	3.3	Ci.-S.	WNW	Cu.	ENE		∠ p.	
10.	58.80	26.7	31.3	21.6	79.3	20.5	NE, SE	242.5	3.3	Ci.-S.		S.-Cu., Cu.			a. p.	
11.	58.86	26.9	32	21.5	78.3	20.6	Variable	168	6.5	Ci.-S.	NNW	Cu.	E		a. ∠ p.	
12.	58.63	26.9	31.9	21.8	78	20.3	Variable	147.6	3.8	Ci.-S.	NW	Cu.-N.			b a. ∠ p.	
13.	58.97	26.6	32.1	22.2	81	20.6	NW quad.	145.2	6.7	Ci.-S.	W	Cu.-N.	E		a. p. ∠ p.	
14.	58.96	27	32.5	22.5	82.8	21.8	NW, SE	201.2	6.3	Ci.-S.		Cu.-N.	E		a. p. ∠ p.	
15.	58.59	27.4	32.6	22.1	79.8	21.3	NE quad.	140.7	5.3	A.-Cu.	ESE	Cu.-N.	E	.8	a. p. ∠ p.	
16.	58.77	26.4	29.9	23.9	84.3	21.4	SE	138.5	9.2	A.-Cu.	ESE	Cu.-N.	E		d a. p. ∠ p.	
17.	59.22	27.2	30.6	23.3	81.3	21.6	SE	149.9	7.2	Ci.-S.	NE	Cu.	SW		b a. ∠ p.	
18.	59.70	27.3	31.1	22.6	82.3	21.9	NE	121.4	5.5	Ci.-S.		Cu.-N.	E		a. ∠ p.	
19.	60.26	27.1	32.4	22.3	82.3	21.7	N	159.6	4.5	Ci.-S.		Cu.-N.	E		a. ∠ p.	
20.	59.60	27.6	31.9	22.5	78.8	21.2	N	135.1	5.7	Ci.-S.		Cu.-N.	E		b a. ∠ p.	
21.	59.18	27	31.1	23.5	84.7	22.2	NW	169.6	8.2	Ci.-S.	S	Cu.-N.	E	2.8	b a. ∠ p.	
22.	59.51	27.2	31.3	22.4	82.8	22	S quad.	144.9	8	Ci.-S.	S	Cu.-N.	E		b a. ∠ p.	
23.	59.89	27	31.4	23.2	86.7	22.8	Variable	140.2	5	Ci.-S.		Cu.-N.	ENE	1.3	d a. ∠ a. p.	
24.	59.78	25.6	31.2	22.4	91.3	22.2	N quad.	134.8	6.3	Ci.-S.		Cu.-N.	E	13.2	a. ∠ p.	
25.	59.86	25.4	32	21.2	85.8	20.6	Variable	129	7.5	Ci.-S.	N	Cu.-N.	E		∠ p.	
26.	59.26	26.4	30.5	23.3	84.5	21.6	Variable	104.1	6.7	Ci.	NW	Cu.-N.		.5	a. p. ∠ a. p.	
27.	59.13	26.3	32.1	22	84.3	21.3	NNW, S	162.1	4.8	A.-Cu.	E	Cu.-N.	WNW		d a. ∠ p.	
28.	59.97	26.9	31.6	22.4	82.5	21.4	Variable	114.3	7.5	A.-Cu.	SE	Cu.-N.		.3	a. p. ∠ p.	
29.	60.21	26.6	31.6	21.9	82.3	21	SW quad.	109.3	5.3	Ci.-S.		Cu.-N.	E	2.3	d a. ∠ d p.	
30.	58.50	27.2	31.1	22.4	81.3	21.6	Variable	126.4	6.2	Ci.-S.	E, SE	Cu.-N.	ENE	2.3	d a. ∠ p.	
Mean	758.80	27.1	31.9	22.8	81.3	21.4		157.4	6.2							
Total								4,720.6						82.5		

**TACLOBAN.**

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.			
	Pressure (mean).	Mean.	Maximum.			Minimum.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.					
										Upper.			Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.			
1.	757.80	27.3	32	23.8	84.5	22.6	SE	1.2	6.2		Cu.-N.	ESE	0.5	☉ a.	
2.	57.92	28	32.6	24.8	81.7	22.7	Variable	.8	4.3	Ci.-S.	N	Cu.	ESE	14	☉ a. ☉ p.
3.	57.84	27.1	31.8	23	81.2	21.5	SE quad.	1	8.3	Ci.	NE	Cu.-N.	SE	2.8	☉ a. ☉ a. p.
4.	57.59	27.2	31.4	24.6	84.8	22.6	SE quad.	1.5	8	Ci.-S.	NE	Cu.-N.	SSE	13	☉ a. d <sup>2</sup> p.
5.	56.99	27.9	31.4	24.8	81.4	22.6	SE quad.	1.2	7.3	Ci.-S.	NE	Cu.-N.	ESE	10.7	
6.	57.57	26.5	30.5	23.8	87.3	22.4	ESE	.5	7.8	Ci.	N	Cu., Cu.-N.	ESE	4.3	☉ a. ☉ p.
7.	57.67	27.1	31.2	24.3	87.7	22.2	SE quad.	.7	6.3	Ci.-S.	N	Cu.	ESE	6.9	☉ p.
8.	58.14	26.8	30.4	23.5	85.5	22.3	SE	.7	6	Ci.-Cu.	N	Cu.	ESE	3.9	☉ a. p. ☉ p.
9.	58.53	27.7	31.6	23.4	81.8	22.3	SE	1.2	2.5			Cu.	ESE		☉ p.
10.	58.90	28	31.9	24.2	79.5	22.1	SE quad.	1.2	3.5	Ci.-S.		Fr.-Cu.	ESE		☉ a.
11.	58.99	27.4	32	24.4	83.2	22.3	SE	1	5.5	Ci.-S.	NW	Cu.	ESE		
12.	58.71	28	32.4	24	79.5	22	SE quad.	1.2	4.3	Ci.-S., Ci.		Cu.-N.	ESE	20.6	
13.	58.97	27.6	32	24.5	85.2	23.1	Variable	1.2	8.3	Ci.	NE	Cu.-N.	SE	21.3	☉ ☉ a. p. ☉ p.
14.	59.10	27.3	31.3	23.6	84.8	22.8	NE, SE	1.3	7.5			Cu.-N.	ESE	2.3	☉ a. ☉ a. d <sup>2</sup> p.
15.	58.81	27.6	31.5	25	83.5	22.8	SE quad.	.7	5.8	Ci.-S.	N	Cu.	ESE	1.3	☉ a. ☉ a. p. d ☉ p.
16.	58.49	26.6	31.5	24	87.3	22.5	Variable	.5	8.3	Ci.-S.		Cu.-N.	ESE	7.1	☉ a.
17.	59.10	27.5	31.6	23.5	83.2	22.3	W	.7	6.7	Ci.-S.	N	Cu.	SE		
18.	59.72	28	32.4	25.3	83.5	23.2	SE	.8	6.2	Ci.-S.	N	Cu.	SE	7.4	☉ a.
19.	60.28	28	32	24.8	83	23.1	SE quad.	.8	4.8	Ci.-S.		Cu.	ESE		☉ a. ☉ p.
20.	59.55	28.2	32.7	24.3	81.2	22.6	WNW	.5	4.5			Cu.	SE		☉ a. p.
21.	59.24	27.5	32.4	24.6	84.5	22.9	NW	1.2	7	Ci.	NNE	Cu.	SSW		☉ a. ☉ a. p. ☉ p.
22.	59.32	28.1	32.5	24.4	83	23.2	SE quad.	1	4.8	Ci.-S.	NE	Cu.	SW		☉ a. p.
23.	59.60	28	33	24.4	83	23.1	NW	.7	4.5	Ci.-S.		Cu.	-----		☉ a. ☉ p.
24.	59.64	26.8	31.5	24	89.2	23.2	WNW	.7	5.7	Ci.-S., Ci.	NE	Cu.-N.	S	13.2	☉ a. d <sup>2</sup> a. ☉ ☉ a. p.
25.	59.76	26.4	31.6	23	86.8	22	NW	1	6.5	Ci., Ci.-S.	NNE	Cu.	SE	11.8	☉ a. ☉ a. p.
26.	59.48	25.9	31.3	23	87	21.4	SE, E	.8	7.7	Ci.-S.		Cu.-N.	ESE, SE		☉ a. ☉ a. p.
27.	59.12	27.2	32	22.8	81	21.5	NW	.7	5.3	Ci.-S.		Cu.-N.	SE	12.7	☉ a.
28.	59.99	26.8	31.6	24	85.3	22.1	Variable	.3	6.5			Cu.-N.	SE		☉ a. ☉ a. p.
29.	60.31	26.9	32	24	85.3	22.3	E	1.2	4.8	Ci.-S.	NW	Cu.-N.	ESE		☉ a. d <sup>2</sup> p.
30.	58.77	27	32	24.5	87.2	22.8	Variable	.7	4.5			Cu.	ESE, SE	1	☉ a. ☉ a. p.
Mean	758.86	27.3	31.8	24.1	84	22.5		.9	6						
Total														154.8	

## Meteorological data for first and second class stations—Continued.

## CAPIZ.

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied,  $-1.81$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
							Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	$^{\circ}C$ .	$^{\circ}C$ .	$^{\circ}C$ .	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	758.06	28	32.8	25	82.2	22.8	NE	160	4.2	Ci., Ci.-Cu.	Cu.	E 0.5
2.	57.86	28.6	33.3	26.4	81.5	23.5	ENE	198	5.2	Ci.	NE, E	5.5
3.	57.75	25.8	29.7	23.4	88.3	21.7	NE	84	8.8	Ci.-S.	N	7.6
4.	57.12	27.7	33.3	23.9	84.3	23	ENE	128.4	8	Ci.-Cu.	Cu.	1
5.	56.28	27.7	33.2	23.8	82.7	22.6	E	121	8.2	Ci.	SE, E	3.8
6.	57.22	26.1	29.7	24.4	95	23.9	NW	67.7	7.7	Ci., Ci.-S.	Cu.	3.6
7.	57.12	27.7	32.5	24.7	81.8	22.3	ENE, E	154.4	5.2	Ci.	E	5.3
8.	57.69	27.9	33.4	23.9	82.3	22.8	E	154.5	4.5	Ci.	Fr.-N. SE, ESE	5.6
9.	58.07	27.7	32.8	23.4	84.3	23.2	E	132.3	4.5	Ci.	Cu.-N.	5.6
10.	58.49	27.3	33.3	24.7	84.3	23.2	SE quad.	93.3	5.5	Ci.	Cu.-N., N.	5.6
11.	58.58	26.7	31.7	24.4	87.7	22.5	NW, NE	65.5	7.5	Ci.-S.	Cu.-N., SE	5.6
12.	58.43	27.6	33.3	23.8	82.5	22.5	SE, ENE	102.5	4.5	Ci.	Cu.-N.	5.6
13.	58.90	27.4	32.5	24.4	86.3	23.2	WSW, NNE	86.3	8.2	Ci.-S.	N	3.1
14.	58.62	27.2	32.8	22.2	84.4	22.5	E	121.4	7.5	Ci.	N., Fr.-N.	46.4
15.	58.59	26.6	32.7	22.3	86.8	22.5	NE, W	93.7	8.2	Ci.-S.	Cu.-N.	5.6
16.	58.35	26.1	32.7	23.8	88	22.4	SW quad.	75.5	7.5	Ci.-S.	Fr.-N.	7.9
17.	58.96	25.9	32.3	23.5	89.5	22.1	ENE, WSW	72.6	7.5	Ci.	Fr.-N.	5.6
18.	59.30	27.2	32.3	23.3	85.5	22.2	NE	72.6	6.5	Ci.	Fr.-N.	5.6
19.	60.23	26.7	32.4	24.3	85.5	22.2	NE, ENE	72.6	6.5	Ci.	Fr.-N.	5.6
20.	59.65	27.5	32.4	23.7	84.8	22.5	N quad.	85.2	5.7	Ci.-S.	Cu.	38.1
21.	59.16	26.6	32.6	23.2	87.7	22.5	S, N	85.4	8.8	Ci.-S.	N	1.5
22.	59.21	26.3	33.2	23.3	86.8	21.9	NE, S	90.2	5.3	Ci.	Cu.-N.	8.4
23.	59.60	27.2	33.2	23.2	83.7	22.1	Variable	94.2	5.2	Ci.	Cu.	5.6
24.	59.22	27.2	33.7	24	84.5	22.5	NE	85.8	6.2	Ci., Ci.-S.	Fr.-N.	11.7
25.	59.56	26.5	31	24.2	86.8	22.1	Variable	93	8.3	Ci.-S.	N	6.6
26.	58.99	27.3	32.6	24	84.8	22.5	ENE	115.9	8.2	Ci.	ENE	5.6
27.	58.74	26.8	32.7	23.4	86.5	22.5	Variable	112.1	7.5	Ci.	Fr.-N., Cu.-N.	5.6
28.	59.90	25.8	31.1	23.6	91.8	22.6	N	66.9	8.7	Ci., Ci.-S.	N	3.3
29.	59.32	26.9	32.4	24	89	23.4	N	67	6.7	Ci.-S.	N., Fr.-N.	5.6
30.	58.46	27.2	32.8	24.2	86.7	23	ENE	84.4	5	Ci.	Variable	9.9
Mean	758.60	27	32.5	23.9	85.8	22.6		103.3	6.8			174.3
Total												

## CALBAYOG.

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.80$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
							Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	$^{\circ}C$ .	$^{\circ}C$ .	$^{\circ}C$ .	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	757.97	27	33.1	23.7	83.8	22	N	126.8	5.7	A.-Cu.	Cu., N.	2.5
2.	57.79	27.7	33.4	23.7	83	22.6	Variable	154	4.5	Ci.-S.	Cu.-N.	11.7
3.	57.62	26.7	29.9	24.6	84.7	22	NE	98	8	Ci.-S.	S.-Cu.	2.8
4.	57.31	26.7	31.1	23.4	86.2	22.2	N	145.4	4.5	Ci.-S.	Cu., Cu.-N.	5.8
5.	56.76	27.4	31.8	23.9	82.8	22.2	Variable	135.3	5.8	Ci.-S.	Cu.-N.	5.8
6.	57.40	26.3	30.5	23.6	88	22.3	N quad.	116.5	5.2	Ci.-S.	S.-Cu.	3
7.	57.43	26.4	32.8	23	85.2	21.6	N	138.6	4.3	Ci., Ci.-S.	Cu.	3.8
8.	57.95	25.9	31.1	23.1	87.7	21.6	NE, N	128.9	2.8	Ci., Ci.-S.	Cu.	1.5
9.	58.31	26.8	32.1	22.4	83.8	21.7	N	146.8	2.2	Ci., Ci.-S.	S.-Cu.	5.6
10.	58.75	26.6	31.7	22.6	85.2	21.7	N quad.	155.6	2.7	Ci., Ci.-S.	Cu.-N.	1.8
11.	58.71	27	32.7	22.7	81.5	21.1	N	152.5	4	Ci.	Cu.-N., Cu.	5.6
12.	58.54	27.6	32.1	22.5	77.2	20.7	Variable	142	2.2	Ci.-S.	Cu.	5.6
13.	58.83	26.7	33.2	23.5	83.8	21.6	N	152.7	6.5	Ci.-S.	S.-Cu.	5.6
14.	58.82	27.4	31.7	23	83.2	22.3	S, NNE	162.4	4.7	Ci., Ci.-S.	Cu.	5.6
15.	58.51	27	32.1	23.6	83.5	21.9	NE	128.1	3.7	Ci.	Cu.	5.6
16.	58.24	26.4	31.6	23.5	87	22.2	NNE, SSW	115.5	6.5	Ci.-S.	S.-Cu.	5.6
17.	58.74	27.2	31.7	23.3	84	22.2	Variable	120.7	4.3	Ci.	Cu.	5.6
18.	59.50	26.8	31.7	23.8	84.8	21.9	N quad.	134.9	3.5	Ci., Ci.-S.	Cu.	5.6
19.	60.10	26.5	33.4	23.2	86.7	22.1	N quad.	133.5	3.2	Ci.	Cu.	5.6
20.	59.53	27.2	32.4	22.7	84.8	22.4	N quad.	147.2	2.8	Ci.-S.	Cu.	5.6
21.	59.08	27.1	32.1	23.8	86.3	22.9	Variable	123.1	6.5	Ci.-S.	Cu.	5.6
22.	59.19	27.7	32.1	22.9	82.3	22.6	Variable	141.6	1.7	Ci., Ci.-S.	Cu.	5.6
23.	59.46	27.8	33.3	23.6	83.5	23	Variable	141.4	1.5	Ci.-S.	Cu.	5.6
24.	59.44	26.6	32.7	23.2	85	21.6	N	156.5	4.8	Ci.-S.	Cu., Cu.-N.	1.8
25.	59.68	26	31.7	22.7	86.8	21.6	N	120.9	6.2	Ci., Ci.-S.	Cu.	11
26.	59.47	25.6	30.7	22.8	87.5	21.1	NE quad.	138.6	7.2	Ci.-S.	Cu., Cu.-N.	3
27.	58.90	26	31.6	22.2	87	21.4	N quad.	159.7	4.2	Ci.-S.	Cu.-N.	1
28.	59.85	26.6	32.4	23.4	85.3	21.8	Variable	130.8	6.5	A.-Cu.	S.-Cu.	5.6
29.	60.01	26.4	30.7	22.8	88.2	22.5	N quad.	128.4	4.7	Ci., Ci.-S.	Cu.	4.3
30.	58.56	26.2	30.7	23.2	89.5	22.5	Variable	116.6	4	Ci.-S.	Cu.	5.6
Mean	758.68	26.8	31.9	23.2	84.9	22		136.4	4.5			60.7
Total								4,093				

## Meteorological data for first and second class stations—Continued.

## LEGASPI.

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	758.32	28.4	32.1	24.7	80.7	23	NE	220.5	5.5	Ci.-S.	Cu.-N.	ENE	8.7	● a. ● p.
2.	58.24	28.8	33.3	24.5	80	23.4	NE, NNE	213.3	1.8	Ci., Ci.-S.	Cu.	ENE		● a. ● p.
3.	57.90	28.5	32	25.2	79.3	22.9	NE	167.3	7.7	Ci.-S.	Cu.	E		● p.
4.	57.51	29.3	33.5	24.9	79.2	23.8	NE, ENE	173.2	3.7	Ci.	Cu.	ESE	.3	● p.
5.	56.88	29.2	33.7	24	78.7	23.4	NE quad.	162.1	3	Ci., Ci.-S.	Cu.	E		● p.
6.	57.39	28.7	33.9	23.8	76.5	22.1	ENE, NE	139	3.8	Ci.-S.	Cu.	ESE		● a. ● p.
7.	57.55	29.1	33.7	24.7	75.8	22.7	NE quad.	238.9	3.8	Ci.	Cu.	E		● p.
8.	57.99	29.4	33.6	25.2	75.5	22.8	NE	232.4	2.5	Ci.	Cu.	E		● p.
9.	58.51	28.5	33.5	22.1	76.5	21.9	NE quad.	154.8	1.2	Ci., Ci.-S.	Cu.	E		● p.
10.	58.78	29.3	34	24.8	75	22.5	NE	233.8	2.3	Ci.	Cu.	NNW		● p.
11.	58.73	28.7	33.7	22.8	76.2	22.1	NE, ENE	175.4	3	Ci., Ci.-S.	Cu., Fr.-Cu.	E		● p.
12.	58.60	28.5	33.9	22	77.3	21.6	NNE, NE	150.1	1	Ci.-S.	Cu.	E		● p.
13.	58.78	28.5	34.5	22.9	79.3	22.4	NNE, NE	116	3.3	Ci., Ci.-S.	Cu.	ENE		● p.
14.	58.90	28.6	34.2	22.3	78.2	22.4	NE	166.1	4.5	Ci.	Cu.	ENE	.8	● p.
15.	58.52	29.1	33.6	23.6	77.8	22.9	ENE	152.4	2.3	Ci.	Cu.	E		● p.
16.	58.17	28.3	34.5	24	80.7	22.7	NE, ENE	102.4	5	Ci.	Cu.	E		● p.
17.	58.63	28.1	33.6	22.9	80.2	22.3	S	132.2	3.8	Ci.-S.	Cu.	S		● p.
18.	59.44	28.7	34.8	23	79.3	22.9	NE quad.	107.4	3.2	Ci.-S.	Cu.	E		● p.
19.	60.22	28.3	34.2	23	79.3	22.4	NE	93.6	3.5	Ci.-S.	Cu.	E		● p.
20.	59.55	28.5	34.8	22.5	79	22.5	ENE, E	98.5	3	Ci.	Cu.	E, ESE		● p.
21.	58.97	28.7	35	23	78.2	22.2	E	101.8	3.2	Ci.	Cu.	SW		● p.
22.	58.88	28.6	35.3	21.6	75	21.2	SW quad.	132.5	1.2	Ci.	Cu.	WSW		● p.
23.	59.34	28.8	35.6	23	76.5	21.9	SSW	110.2	2	Ci.-S.	Cu.	WSW		● p.
24.	59.35	27.6	34.7	22.5	80.7	21.8	NNE, SE	122.7	4.7	Ci.-S.	Cu.	E	.8	● p.
25.	59.88	26.4	29.9	21.9	81.3	20.6	NE	161.6	6.3	Ci.-S.	Cu.-N.	NE	9.4	● a. ● p.
26.	59.63	26.8	32.8	22	83.5	21.6	NE, ENE	140.5	7.8	Ci.-S.	Cu.	E	1	● a. ● p.
27.	59.20	27	32.9	21.4	82.2	21.4	Variable	112.4	4.5	Ci., Ci.-S.	Cu.	E	31.7	● a. ● p.
28.	60.14	26.1	31.1	22.1	88.2	22.1	NE	109.5	7.5	Ci.-S.	N., Fr.-N.	E	3.3	● p.
29.	60.21	27.8	32.9	21.6	81.8	22.4	NE	114.4	3.7	Ci.	Cu.	NE		● p.
30.	58.62	28.8	34.3	23.8	79.7	23.3	NE	132.7	1.3	Ci., Ci.-S.	Cu.	ENE		● p.
Mean	758.76	28.4	33.7	23.2	79.1	22.4		148.9	3.7					
Total								4,467.7					56	

## ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.		
1.	758.40	28.6	31.8	25.5	81	23.4	NE	310	6.2	A.-Cu.	E	Cu.	NE	d° a. p.
2.	58.29	29.4	32.6	27.5	76.5	23.1	NE	353.3	5.2	Ci.-S.	E	Cu.	NE quad.	1.3
3.	57.50	28.9	31.8	25.3	78	23	NE	218.6	7	Ci.	SW	Cu.	ENE, E	1.5
4.	57.12	28.6	33.5	24.8	77	22	S quad.	182.2	7	Ci.	SW	Cu.	SE	○ a. p.
5.	56.34	28.3	33.2	24	81.2	23	SW	155.9	7.8	Ci.-S.	NW	Cu.	SE	○ a. p.
6.	57.31	27.2	31.4	24.4	85.2	22.7	SW	164	9.7	Ci.-S.		S.-Cu.	SE	○ a. p.
7.	57.44	27	30.2	24.4	86	22.8	SW	293.5	9.8	Ci.-S.		S.-Cu.	NE	○ a. p.
8.	57.95	26.6	30.6	24	85.7	22	SW	177.5	7.8	Ci.-S.		Cu.	E	○ a. p.
9.	58.03	26.8	32	23.5	86.7	22.5	SW	210.5	4	Ci.		Cu.-N.	SE	○ a. p.
10.	58.41	27.6	32.3	23.6	81	21.8	SW	181.1	6.5	Ci.	N	Cu.-N.	E	○ a. p.
11.	58.38	27.7	31.3	23.5	82.2	22.4	E, SW	166.6	8.8	Ci.-S.		S.-Cu.	SSE, S	○ a. p.
12.	58.21	27.8	33.4	23.6	78.2	21.2	SW	211.4	6.5	Ci.-S.	NNE, N	Cu.	SE	○ a. p.
13.	58.52	27.2	32.3	23	81.7	21.7	E, SW	202.2	5.2	Ci.-S.	E	Cu.	E, SE	○ a. p.
14.	58.27	28.1	34.3	24	81.5	22.7	SW	201	7	Ci.		Cu.	SE, SSE	○ a. p.
15.	58.04	28.3	33.5	24.5	80	22.4	SW quad.	207.1	6.7	Ci.	NE	Cu.-N.	Variable	○ a. p.
16.	57.81	28.6	34	24.1	79.5	22.8	Variable	214.1	9.2	A.-Cu.	SE	S.-Cu., Cu.-n. SSW, E	E	○ a. p.
17.	58.40	27.5	32.9	23.1	80.8	21.8	SW	200.4	7.5	Ci.-S.		Cu.	SW	○ a. p.
18.	59.23	27.9	32.5	24.2	82.8	22.8	SW	167.9	8.5	Ci.-S.	ENE, E	S.-Cu.	SE	○ a. p.
19.	60.05	26.6	32.2	23.3	86.7	22.3	SW	222.6	7	Ci.-Cu.	E	Cu.-N.	SE	○ a. p.
20.	59.57	27.2	33.1	22.6	85.5	22.7	SW	200.9	4.2	A.-Cu.	SW	Cu.	S	○ a. p.
21.	58.57	27.8	33.9	23	82.5	22.6	SW	210.9	2.8	Ci.		Cu.	S	○ a. p.
22.	58.52	28.4	33.4	24	78.7	22.2	SW	254.5	3	Ci.		Cu.	SW	○ a. p.
23.	58.93	28	34	24	78.5	21.8	SW	223.9	3.5	A.-Cu.	S	S.-Cu.	WSW	○ a. p.
24.	59	28.4	34.3	24.5	78.3	22.2	SW	242	5.7	Ci.		N.	E	○ a. p.
25.	59.45	26.5	30.2	23.3	85.5	21.9	SW	258.2	8.8	Ci.-S.		S.-Cu.	NE	○ a. p.
26.	59.12	27.9	31.1	23.6	79.2	22	N quad.	254.6	5.8	Ci.	NE	Cu.	NE, E	○ a. p.
27.	58.89	26.5	31.6	24	87.7	22.4	SW	212.8	7.7	A.-Cu.	NE	Cu.	NE	○ a. p.
28.	59.86	26.3	30.5	23.4	89.3	22.6	SW	163.3	9.7	Ci.-S.		S.-Cu.	SE quad.	○ a. p.
29.	59.92	26.8	31.4	23	86.3	22.4	SW, NW	201.6	7.8	A.-Cu.	WSW	S.-Cu.	SE, S	○ a. p.
30.	58.27	27.9	31.9	23.6	83.7	23.2	SW, NW	222.4	3.5	Ci.		S.-Cu.	NE	○ a. p.
Mean	758.46	27.7	32.4	24	82.2	22.4			6.7					
Total								6,485					171.2	

## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5 meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	757.92	28.7	33.8	24.9	73.2	21.2	NE	1.7	6.8	Ci.-S.		Cu., S.-Cu.	SE	0 a. $\searrow$ p.
2.	57.83	29.3	34.8	24.1	71.3	21.2	E quad.	1.2	5.3	Ci.-S.	SSE	Cu.	E	0 a. $\searrow$ p.
3.	57.05	29.2	34.2	24	73.2	21.5	E	1.2	5.8	Ci.-S.	S	Cu.	ESE	0 a. $\searrow$ p.
4.	56.80	28.4	33.8	24.2	78.8	22.3	Variable	1.2	7.2	Ci.-S.	NW	Cu.	ESE, E	0 a. $\searrow$ p.
5.	56.14	28.8	35.3	24	77	22.3	Variable	1	7.8	Ci.-S.	NW	S.-Cu.	ESE	16 $\searrow$ a. $\uparrow$ d $\searrow$ p.
6.	56.67	27.8	32	24.4	80.8	22.2	NE	1	8.5	Ci.-S.		N.	SE	0 a. $\searrow$ p.
7.	57.10	27.9	32	24	78.5	21.8	NE	1	8	Ci.-S.		S.-Cu.	SE	.5 $\searrow$ d a. $\uparrow$ $\searrow$ p.
8.	57.42	27.6	33.6	24.5	78.7	21.4	Variable	1.3	6.3	Ci.-S.	NE	Cu.	E	0 a. $\searrow$ p.
9.	58	28	33	23.4	79.7	22.1	W, NE	.8	6.2	Ci.-S.		Cu.	E, SE	0 a. $\searrow$ a. p.
10.	58.07	27.2	33.4	23.5	84.3	22.3	NE, WSW	1.2	8	A.-S.	NE	S.-Cu., cu.-N, S, E	SE	6.9 $\searrow$ a. $\bullet$ $\searrow$ p.
11.	58.04	27.8	34.2	23.6	80.8	21.9	Variable	.8	7.5	Ci.-S.	NE	Cu.	SE, S	0 a. $\searrow$ a. $\oplus$ p.
12.	58.04	27.8	33.2	23.5	77.2	21	Variable	1.3	6.5	Ci.-S.	NW	Cu.	S, SE	0 a. $\searrow$ p.
13.	58.17	28	35	23.5	81.5	22.4	E quad.	1.7	5.3	Ci.-S.	NNE	Cu.	SE	1.3 $\searrow$ a. $\bullet$ $\searrow$ p.
14.	57.94	28.3	33.6	23.5	78.2	22	S quad.	1.7	6.2	Ci.-S.	E	Cu.	SE	2.5 $\searrow$ a. $\bullet$ $\searrow$ p.
15.	57.85	27.8	33	24.4	83.5	23	NE, SSW	1.5	7.7	Ci.-S.	NE	S.-Cu.	SE	0 a. $\searrow$ p.
16.	57.61	28	35.5	23.3	80	22.1	SW quad.	1.3	6.8	Ci.-S.		Cu.	SE	36.6 $\searrow$ D <sup>2</sup> a. $\bullet$ $\searrow$ 42 p.
17.	58.16	27.8	33.2	23.7	81.8	22.5	Variable	1.2	7.2	Ci.-S.	SSE	Cu., Cu.-N.	E	14 a. p.
18.	58.97	28.2	34	24.3	81.3	22.8	S quad.	1.2	7.7	Ci.-S.		S.-Cu.	E	0 a. $\searrow$ a. p.
19.	60.07	26.7	33.8	22.6	86.3	22.2	NE quad.	1.3	8	Ci.-S.	SE	Cu.-N.	E	26.9 $\searrow$ a. $\bullet$ $\searrow$ a. $\bullet$ p.
20.	59.59	27.4	34	22.4	81.5	22	E quad.	.8	6.7	Ci.-S.		Cu.	E	14 a. $\searrow$ a. $\uparrow$ $\searrow$ p.
21.	58.44	27.9	33.8	23.5	83	22.9	NE	.8	7	Ci.-S.	SW	Cu.	E	0 a. $\searrow$ a. $\oplus$ p.
22.	58.62	28.2	34	23.5	79	22.1	NE, S	1.3	4.5	Ci.		Cu.	E	D <sup>2</sup> a.
23.	59.03	27	31.5	23.5	86.8	22.9	NE quad.	1.2	6.5	Ci.-S.	ESE	Cu.	SSE	8.1 $\searrow$ a. $\bullet$ $\searrow$ p.
24.	59.10	26.7	34.2	23.8	86.5	22.4	NE	.8	7.3	Ci.-S.		Cu.	SW	2.5 $\searrow$ a. $\bullet$ $\searrow$ 4 p.
25.	59.25	26.5	31.8	23.1	83.8	21.5	E	1	8	Ci.-S.		cu., S.-Cu.	SE, S	0 a. $\searrow$ a. $\bullet$ $\searrow$ p.
26.	59.11	26.5	33	23	83.7	21.2	E quad.	1.2	6.3	Ci.-S.		Cu.	SE, E	50.1 $\searrow$ a. $\bullet$ $\searrow$ 2 p.
27.	58.71	26.1	32.8	22.7	84.3	21.1	NE, SW	1.2	7.5	Ci.-S.	NW	Cu.-N.	SE	0 a. $\searrow$ 42 p.
28.	59.74	25.6	32.2	22.6	87.8	21.2	E quad.	1.2	8.3	Ci.-S.	SE	Variable		D <sup>2</sup> a. $\bullet$ $\searrow$ 4 d p.
29.	59.73	27.4	33.2	23.2	81.7	21.8	Variable	1.2	7.2	Ci.-S.	SE	Cu.	E	0 a. $\searrow$ p.
30.	58.29	26.6	34.4	22.4	85.3	21.9	E quad.	1.7	6.8	Ci.-S.		Cu.	E	46 $\searrow$ a. p. $\bullet$ 2 p.
Mean	758.25	27.6	33.5	23.6	81	22		1.2	7					
Total													205.9	

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	758.82	29.1	33.1	26	79.3	23.6	NE	256.5	3.3	Ci.	Cu.	E	2
2.	58.58	28.7	32.8	25	81	23.4	NE	202.1	4.7	Ci.	Cu.	E	11.2
3.	57.91	28.2	32.8	24.7	85.3	23.8	E quad.	131.8	6.7	Ci., Ci.-S.	Cu.	E	
4.	57.51	27.8	33.5	22.1	84	23.1	Variable	122.9	5.7	Ci.	Cu.	E	51.3
5.	56.78	27.6	32.8	23.5	83.8	22.8	ENE	141.6	5.7	Ci., Ci.-S.	Cu.	E	22.1
6.	57.67	26.3	31.8	24.2	90.8	23	N	98.9	10	Ci.-S.	Cu.	S, E	30.2
7.	57.93	27.7	32.2	24.1	85	23.2	E	150.1	8.3	Ci.-S.	Cu.	E	
8.	58.22	27.4	33.1	24.1	86.3	23.1	E, ENE	128	3.8	Ci.	Cu.	E	1.5
9.	58.60	27.9	32.6	23.2	82.7	22.8	E	145.5	1.8	Ci.	Cu.	E	
10.	58.84	27.4	34.6	23.7	85.2	22.7	E	136.6	5.7	Ci.	Cu.	E	6.6
11.	58.96	27	32.8	23.6	87.7	23	E	86.6	10	Ci.-S.	Cu.	S	
12.	58.53	28	33.2	23.8	82.7	22.8	E, ENE	133.4	7.3	Ci., Ci.-S.	Cu.	E	
13.	58.83	28.4	33.4	24.1	82.8	23.5	NE	136.6	3.3	Ci.	Cu.	E	
14.	58.71	27.8	33.8	24	84.3	22.9	ENE, WSW	128.5	4.7	Ci.	Cu.	E	19.8
15.	58.45	28.6	34	24	82.2	23.5	E	114.5	4.5	Ci.	Cu.	E	
16.	58.12	28.7	33.8	24.8	80.8	23.3	ENE	129.5	4.8	Ci.	Cu.	E	1
17.	58.70	28.1	32.8	24.3	81.7	22.8	ENE, SW	132.5	4.2	Ci.	Cu.	E, S	4.3
18.	59.56	28.1	33.8	24.2	83.8	23.4	Calm	75.9	8.7	Ci.-S.	Cu.	S	11.9
19.	60.50	27	33.1	24.6	88.5	23.2	WSW	91.7	4.5	Ci.	Cu.	S, W	
20.	59.84	28.1	32.8	23.1	79.5	22	E	111.8	2.8	Ci.	Cu.	E	
21.	58.88	27.4	34.2	24	84.3	22.6	WSW	133.3	3.2	Ci.	Cu.	SW	
22.	58.83	28.4	33.5	24	85.8	24.7	Variable	126.8	4.3	Ci.	Cu.	SSW	6.9
23.	59.12	28.7	34.5	24.5	84.2	24.3	SW	108.8	3.5	Ci.	Cu.	SSW	1.3
24.	59.40	27.8	34.1	24.4	85.7	23.6	WSW	111.4	5.7	Ci., Ci.-S.	Cu.	E	1.3
25.	59.88	26.2	31.2	23.7	84.5	21.3	E	124.5	7.3	Ci.-S.	Cu.	E	
26.	59.74	26.3	31.5	22.9	85.2	21.6	E	135.3	7.8	Ci., Ci.-S.	Cu.	NE	.3
27.	59.23	26.4	32.2	23.6	87	22	Variable	130	6.5	Ci., Ci.-S.	Cu.	E	2.8
28.	60.39	26.3	31	23.4	91	23.1	Calm	74.3	9.5	Ci.-S.	Cu., S.-Cu.	S	.8
29.	60.32	27.7	32.2	23.1	85.7	23.4	E	137.5	9.5	Ci.-S.	Cu.	E	7.9
30.	58.63	28.3	33.1	24	83	23.4	NE	150.4	2.5	Ci.	Cu.	E quad.	1.5
Mean	758.85	27.7	33	24	84.5	23.1		129.6	5.7				
Total								3,887.3				184.7	

\* This is an approximate height of the barometer above sea level.



## Meteorological data for first and second class stations—Continued.

## SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied,  $-1.69$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	758.71	28.6	35.1	23	71.7	20	E, N	3	2.3	Ci.	Cu.	E		d a.
2.	58.30	29.3	36.4	21.9	68.2	19.7	N	2.7	2.3	Ci.	Cu.	E		Ω a.
3.	57.56	30.4	37.2	23.6	67	21.1	N	1.7	4.7	Ci.	Cu.	SE, E		Ω a. ↘ p.
4.	57.39	28.4	36.6	23.7	78.3	21.8	N	1.7	7.3	Ci.	Cu., Cu.-N.	SE	6.3	Ω a. ↘ p.
5.	56.72	28.5	35.9	23.4	77.8	22	SSW	1.7	6.3	Ci.	Cu.	S	2.5	Ω a. ↘ d p.
6.	57.66	25.5	34.1	23.5	92	22.2	SSW, N	2	9	Ci.-S.	Cu.-N.	S	1.3	Ω a. ↘ p.
7.	57.63	28.4	34.7	22.6	74.8	21	SE	2	6.8	Ci.-S.	Cu.-N.	S		Ω a. ↘ p.
8.	58.01	27.9	35	23.3	80.2	22	NE	1.8	5.8	Ci.	Cu.-N.	SE	3	Ω a. ↘ a. p.
9.	58.46	27.8	36.6	23.2	82.2	22.3	NE	2.2	6.5	Ci.	Cu.-N.	SE	6.6	Ω a. ↘ a. p.
10.	58.78	28.1	34	23.7	81.3	22.5	NE	1.8	7.3	Ci.-S.	Cu.-N.	SSE		Ω a. ↘ p.
11.	58.65	28.9	34.7	23.4	75.2	21.8	SE	1.8	7.5	Ci.	Cu.-N.	SE		Ω a. ↘ p.
12.	58.27	28.8	35.1	24.1	78.5	22.4	E	1.8	5.7	Ci.	Cu.-N.	SE	1.3	Ω a. ↘ a. p. ●
13.	58.51	28.6	35.5	23.9	79.3	22.4	SE	2	5.5	Ci.	Cu.	S quad.	1	Ω a. ↘ d p.
14.	58.36	28.3	36.6	22.7	81	22.1	E, SSE	2.7	5.8	Ci.	Cu.-N., Cu. SSE	S	22.1	Ω a. ↘ d p.
15.	58.46	26.4	32.5	23.5	92.7	23.7	ENE, S	1.2	7.8	Ci.-S.	Cu.-N.	S	1.8	Ω a. ↘ p.
16.	57.85	28.7	34.5	24.3	80.7	23.2	S quad.	2	6.2	Ci.	Cu.	SSW		Ω a. ↘ p.
17.	58.32	28.8	35.3	24	79.3	23	S	2.2	6	Ci.	Cu., Cu.-N.	SW	25.9	Ω a. ↘ p.
18.	59.44	27.5	34	22.4	86	23.1	Variable	2	8.3	Ci.-S.	Cu.-N.	SE	16	Ω a. ↘ p.
19.	60.48	27.3	33.5	22.8	85.3	22.8	SE, N	2.2	4.8	Ci.-S.	Cu.-N.	SE	10.4	Ω a. ↘ p.
20.	60.01	27.6	35	22.8	83.7	22.5	SW	1.5	4.5	Ci.	Cu.-N.	SW		Ω a. ↘ p.
21.	59.01	28.6	35.2	23.5	82.7	23.7	SW	1.8	5.7	Ci.	Cu.	SW		Ω a. ↘ p.
22.	59	27.7	35	24	85.5	23.2	SW	1.8	5.2	Ci.	Cu.	SW	24.6	Ω a. ↘ p.
23.	59.41	27.2	34.6	23.3	86.7	22.8	N	1.7	4.8	Ci.	Cu.-N., Cu. SW	SW	3.6	Ω a. p. ↘ p.
24.	59.54	26.8	34.4	22.4	85.5	22	N	1.8	5.2	Ci.	Cu.-N., Cu. SW	SW	1.3	Ω a. p. ↘ p.
25.	59.86	26.5	33.2	22.4	87.5	22.4	N	1.8	6.5	Ci.	Cu.-N.	ESE		Ω a. p. ↘ p.
26.	59.51	27.9	34	22.7	78	21.3	N, SE	1.5	5.7	Ci.-S.	Cu.	E		Ω a. p. ↘ p.
27.	59.19	27	32.4	22.6	86.3	22.7	NE, SE	1.5	6.8	Ci.-S.	Cu.-N.	E quad.	9.7	Ω a. p. ↘ p.
28.	60.36	25.5	33.1	22	90.8	21.8	N	1.7	7.8	Ci.-S.	Cu.-N.	S quad.	40.3	Ω a. p. ↘ p.
29.	60.23	26.5	32.5	22.2	89	22.7	NW	1.5	7.2	Ci.-S.	Cu.-N.	SSW		Ω a. p. ↘ p.
30.	58.84	28.2	33.8	23.2	80.3	22.4	N	1.8	4.8	Ci.	Cu.-N.	W		Ω a. p. ↘ p.
Mean	758.75	27.9	34.7	23.1	81.6	22.2		1.9	6					
Total													175.5	

## DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied,  $-1.67$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.	Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	757.75	30	37	25	68.8	21.4	SE	231.1	2	Ci.		Cu.	☉ ☐ a.
2.	57.64	29.9	37.4	23.5	69.7	21.5	S, NW	224.4	1.8	Ci.		Cu.	☉ ☐ a.
3.	56.96	29.6	36.5	25	76.2	23.1	E, NW	226.3	2	Ci.		Cu.	☉ ☐ a.
4.	56.59	28.6	36.3	24.2	80.2	23.1	SE, WNW	228.8	6.2	Ci.		Cu.	☉ ☐ p.
5.	55.88	28.6	36.9	23.1	78.7	22.3	SE, SSE	218.2	5.5	Ci.		Cu.	☉ ☐ p.
6.	56.61	26.8	34.6	23.5	83.2	21.4	SE	227.2	8.2	Ci.-S.		S.-Cu.	☉ ☐ d p.
7.	56.88	28.3	34.9	23	77.2	21.6	S, SE	194.2	7	A.-Cu.		Cu.	☉ p.
8.	57.20	27.8	36.6	24	77.3	20.9	SE, SSE	226	7.2	A.-Cu.		Cu., N.	☉ a. ☉ ☐ p.
9.	57.67	28.1	36.2	24	78.8	21.8	SE	232.7	6.7	Ci.-S.		Cu. SSE, SW	☉ ☐ p.
10.	58.03	27.6	35.8	24.3	82	22.2	SE	233.8	7.8	A.-S.		Fr.-Cu. SE	☉ a. ☉ ☐ d ☐ p.
11.	57.63	29.1	35.8	24.1	75.8	22.4	SE quad.	250.1	7.2	Variable		Fr.-N. SSE	☉ a. ☉ ☐ d p.
12.	57.29	29.4	35.8	24.8	74	22.2	SSE	224.4	7	Ci.-S.		Fr.-Cu. SE	☉ a. ☉ p.
13.	57.54	29.1	36.4	24.6	73.7	21.6	SE	254.3	7.5	Ci.		Fr.-Cu. SSE	☉ a. ☉ ☐ d p.
14.	57.34	28.8	36.6	24.4	73.8	21.2	SE	261.4	6.3	Ci.-S., Ci.		Fr.-Cu. SE	☉ a. ☉ p.
15.	57.34	28.6	36.3	24.9	78.3	22.2	SE	231.1	7.8	Ci.-Cu.	SE	Cu.	☉ a. ☉ ☐ d p.
16.	57.17	29	35.6	24.5	77.3	22.5	SE	197.8	8.7	Ci.-S.		Cu.	☉ a. ☉ p.
17.	57.56	29	35.6	24.6	78.3	23.2	SE, SW	222.2	7.3	A.-Cu.	SSE	S.-Cu.	☉ a. ☉ p.
18.	58.71	28	36.6	23.5	79.5	21.8	SE quad.	262.5	6.5	Ci.		Cu., N.	☉ a. ☉ p.
19.	59.68	28.1	35.3	23.1	80.3	22.4	Variable	187.5	4.8	Ci.		Cu.	☉ a. ☉ p.
20.	59.40	28.5	33.7	23.9	76.5	21.9	SE quad.	208.9	4.8	Ci.		Cu.	☉ a. ☉ p.
21.	58.31	29.4	35.3	24.5	75.7	22.8	NW	237.9	6.5	Ci.		Cu.	☉ a. ☉ p.
22.	58.35	29.7	34.1	25	74.3	22.8	NW quad.	210.6	3.8	Ci.		Cu.	☉ a. ☉ p.
23.	58.72	29.2	34.8	24.6	74.3	22.1	Variable	176	2.7	Ci.		Cu.	☉ a. ☉ p.
24.	58.84	28.4	34.3	23.2	76.3	21.7	SE	215.8	4.2	Ci.		Cu., Fr.-N.	☉ a. ☉ p.
25.	58.99	28	36.5	23	77.8	21.4	SE quad.	158.4	9	Ci.-S.		Cu.	☉ a. ☉ p. ☉ ☐ p.
26.	58.81	28.6	36.4	23.5	75.7	21.2	Variable	202.9	7.7	Ci.-S.		Cu.	☉ ☉ ☉ p. ☉ ☐ p.
27.	58.48	27.6	34.7	23.2	81.3	21.9	S quad.	183.6	5.3	Ci.		Cu.	☉ ☉ ☉ p.
28.	59.31	26.6	35.1	22.6	83.5	21.4	SE	239.5	6.7	Ci.		Variable	☉ a. ☉ d ☉ p.
29.	59.66	26.8	33.8	23	84.7	22	SE	199.2	9.8	Variable		S.	☉ a. ☉ d ☉ p.
30.	58.30	28.6	34.2	23.5	73.7	21	NW	218.6	7.7	Ci.-S.		Cu.	☉ a. ☉ p.
Mean	757.95	28.5	35.7	23.9	77.2	22		219.5	6.2				
Total								6,585.4					188.6

## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).		Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	757.90	30	35	25.9	69.3	21.3	SE quad.	3.3	4.5	Ci.-S.	S.-Cu., Cu.		☉ p.
2.	57.88	30.2	35.2	25.4	71.2	22.4	Variable	3.5	6.8	Ci.-S.	S.-Cu., Cu.		
3.	57.24	29.9	33.9	26	73.7	22.8	Variable	3.3	4.3	Ci.-S.	Cu.		☉ a.
4.	56.79	28.7	32.8	25.9	80	23.3	Variable	2.5	9.5	Ci.-S.	S.-Cu.	4.1	☉ a. ☐ a. p. ☐ p.
5.	56.06	28.3	33.8	24.2	79.3	22.4	SE quad.	3	9.5	Ci.-S.	Cu.	8.7	☉ a. ☐ a. p. ☐ p.
6.	56.54	26.8	32	24.6	84.5	22.1	SSE	3.7	10	Ci.-S.	S.-Cu.	9.4	☐ a. p. ☐ a. p.
7.	56.98	27.6	32.9	24.9	84.2	22.3	SE quad.	2.3	10	Ci.-S.	S.-Cu.	2.3	☐ a. p. ☐ a. p.
8.	57.28	28.4	32.6	24.4	78.8	22.3	SSE, W	2.5	9.8	A.-Cu.	S.-Cu.	11.4	☐ a. p. ☐ a. p.
9.	57.65	27.8	32.4	24.6	82.8	22.6	S quad.	3	10	A.-Cu.	S.-Cu., Cu.-N.	3	☐ a. p. ☐ a. p.
10.	58.10	26.9	32.9	23.3	89.5	23.4	S quad.	2.2	10	Ci.-S.	Cu.	88.4	☐ a. p. ☐ a. p.
11.	57.68	27.5	32.4	23.1	84.7	22.9	S quad.	2.8	10	Ci., Ci.-S.	Cu.	16	☐ a. p. ☐ a. p.
12.	57.36	27.6	33	23.9	82.3	22.4	S	2.3	10	Ci.-S.	Cu.-N.	2.1	☐ a. p. ☐ a. p.
13.	57.58	27.6	32.9	24.4	84.2	23	S quad.	3	10	Ci.-S.	Cu.-N.	13	☐ a. p. ☐ a. p.
14.	57.33	28.5	33.3	24.8	79.5	22.8	S quad.	3.5	10	Ci.-S.	Cu.	2.8	☐ a. p. ☐ a. p.
15.	57.43	28.2	32.6	24.4	80.3	22.6	S quad.	2.8	10	Ci.-S.	Fr.-Cu.		☐ a. p. ☐ a. p.
16.	57.26	28.9	33.7	25.6	79	23.1	S	2.7	10	Ci.-S.	N.-cf., Cu.-N.	3	☐ a. p. ☐ a. p.
17.	57.86	27.8	32.7	26	87.5	24.2	SE quad.	2	10	Ci.-S.	Cu.-N.	28.4	☐ a. p. ☐ a. p.
18.	58.90	26.6	32.1	24.1	88.3	22.9	SE quad.	2.5	9.8	Ci.-S.	Cu.	18.3	☐ a. p. ☐ a. p.
19.	59.83	27.4	32.7	23.7	85.2	22.8	S, WSW	2.2	9.7	Ci.-S.	Cu.	8	☐ a. p. ☐ a. p.
20.	59.61	28	32.1	24.9	83.8	23.3	SE quad.	2.3	9.7	Ci.-S.	Cu., Cu.-N.	1.5	☐ a. p. ☐ a. p.
21.	58.61	28.3	32.8	24.2	81.2	22.9	SSE	2	9.3	Ci.-S.	Cu.		☐ a. p. ☐ a. p.
22.	58.70	27.5	31.9	25	86	23.3	SW	2.7	9.7	Ci.-S.	Cu.	5.1	☐ a. p. ☐ a. p.
23.	58.91	28	32.4	24.9	83.5	23.2	S quad.	2.7	8.7	Ci.-S.	Cu.		☐ a. p. ☐ a. p.
24.	58.95	28.1	32.9	25.2	83.8	23.6	Variable	2.3	8	Ci.-S.	Cu.-N.		☐ a. p. ☐ a. p.
25.	59.30	27	33.2	23.6	82.7	21.7	SSE	2.3	10	Ci.-S.	Cu.		☐ a. p. ☐ a. p.
26.	59.02	28	34	24.1	79	22.1	SSE	3.5	10	Ci.-S.	Cu.		☐ a. p. ☐ a. p.
27.	58.58	27.9	32.5	24.3	81.8	22.6	SE quad.	2.8	8	Ci.-S.	Fr.-Cu.	3.4	☐ a. p. ☐ a. p.
28.	59.44	25.7	31.9	23.1	89.3	21.8	SSE	2.7	9.7	Ci.-S.	Fr.-Cu.	61.2	☐ a. p. ☐ a. p.
29.	59.71	25.5	30.9	23	91.3	22.2	S, SSE	2.8	10	Ci.-S.	S.-Cu., N.-cf.	84.8	☐ a. p. ☐ a. p.
30.	58.62	27.2	32.2	23.1	82.5	21.8	SSE, NNW	2.7	10	Ci.-S.	S.-Cu.		☐ a. p. ☐ a. p.
Mean	758.10	27.9	32.9	24.5	82.3	22.7		2.7	9.2				
Total												362.3	

## BAGUIO.\*

[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.	Upper.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	636.91	19.8	26.3	16.3	84.7	14.4	E quad.	290.7	6.0	Ci.	Cu.-N. WSW		☉ a. ☐ a. ≡ p.
2.	36.79	19.9	25.2	16.5	82.5	14	Variable	271.1	5.9	Ci. N, NNE	Cu., Cu.-N.	0.8	☉ a. ≡ d p.
3.	36.24	20.3	25.2	16.6	79.7	13.8	Variable	267.4	6.3	Ci. NNE	Cu.-N.	.5	☉ a. ☐ a. d <sup>2</sup> ☐ p.
4.	35.75	19.3	24.8	17.4	89.5	14.9	E quad.	364.7	7.7	Ci. N	Cu.	1	☉ a. ☐ a. d ☐ a. ≡ p.
5.	35.15	20	26	17.2	83.2	14.4	W, SE	331.8	7	Ci.-S. SW	Cu.-N. S, SW	10.9	☉ a. ☐ a. ☐ a. ≡ p.
6.	35.38	18.1	23.2	16	88.5	13.7	SE	375	9.4	Ci.-S., A.-Cu.	Cu.-N. SSW	80.2	☉ a. ☐ a. ☐ a. ≡ p.
7.	35.70	18.6	24.1	16.1	83.2	13.1	SE, SSW	417.6	9.4	A.-Cu. S	Cu.-N. SSE	2.8	☉ a. ☐ a. ☐ a. ≡ p.
8.	36	18.4	24.7	16	84	13.2	ESE	390.3	8.1	Ci. NE	Cu.-N. S, SSE	5.4	☉ a. ☐ a. ☐ a. ≡ p.
9.	36.34	18.8	23.9	16.2	87.5	14	SE	311.8	7.4	A.-Cu. SW	Cu.-N. S, SE	9.9	☉ a. ☐ a. ☐ a. ≡ p.
10.	36.64	18.6	24.6	16.6	89.7	14.2	SE	241.6	9.4	Ci. N	Cu.-N. SE	1.5	☉ a. ☐ a. ☐ a. ≡ p.
11.	36.47	19	24.9	16.1	86.3	14	ESE, SE	322.4	7.9	A.-Cu. WNW	Cu. SE	.5	☉ a. ☐ a. ☐ a. ≡ p.
12.	36.14	19	24.2	16.2	82.5	13.3	SE	347.6	6.1	Ci. N quad.	Cu.-N. E	4.8	☉ a. ☐ a. ☐ a. ≡ p.
13.	36.40	18.8	24.6	16.1	87.8	14	SE	364.2	6.7	Ci. NNE	Cu. E, SSE	4.1	☉ a. ☐ a. ☐ a. ≡ p.
14.	36.26	19.4	24.2	16.5	81.3	13.4	SE	515.4	7.4	Ci. NNE	Cu., Cu.-N. SE	29.2	☉ a. ☐ a. ☐ a. ≡ p.
15.	36.28	19.2	25.8	16.3	88	14.5	SE	330	8.6	A.-Cu. E	Cu.-N. S quad.	.8	☉ a. ☐ a. ☐ a. ≡ p.
16.	36.25	19.4	24.6	16.3	86.3	14.2	ESE, SE	281.8	8.3	Ci.-S. N	Cu.-N. SE, SSE	.5	☉ a. ☐ a. ☐ a. ≡ p.
17.	36.46	19.6	24.8	17.1	91	15.4	Variable	245.6	9.1	Ci.	Variable SE	2.5	☉ a. ☐ a. ☐ a. ≡ p.
18.	37.31	18.8	25.1	15.7	88	14	Variable	369.1	7.7	A.-Cu.	Cu. SE	30.2	☉ a. ☐ a. ☐ a. ≡ p.
19.	38.16	18.7	23.9	15.4	84.2	13.6	Variable	236.6	7.1	Ci.	Cu.-N. SSE	5.3	☉ a. ☐ a. ☐ a. ≡ p.
20.	37.87	18.4	23.6	15.8	91.5	14.4	Variable	262.9	8	Ci.	Cu.-N. SE	5.6	☉ a. ☐ a. ☐ a. ≡ p.
21.	37.13	19.2	24.2	16	86.2	14.2	W, NW	274.5	6.4	Ci.	Cu.-N.	1.3	☉ a. ☐ a. ☐ a. ≡ p.
22.	37.12	18.8	24.7	15.7	88.7	14.4	W quad.	266.4	6.6	Ci., Ci.-S.	Cu.-N. SSE	8.4	☉ a. ☐ a. ☐ a. ≡ p.
23.	37.53	19.1	23.4	16.4	88.8	14.6	SW quad.	272.3	7	Ci. E	Cu., Cu.-N. sw, s		☉ a. ☐ a. ☐ a. ≡ p.
24.	37.45	18.5	23.5	15.7	86.7	13.8	Variable	282.1	7.1	Ci. E	Cu.-N. E	35.8	☉ a. ☐ a. ☐ a. ≡ p.
25.	37.65	18.6	25.4	15.6	84.7	13.4	NE quad.	229.8	8.4	Ci. ENE	Cu.-N. SE	34.3	☉ a. ☐ a. ☐ a. ≡ p.
26.	37.32	19.3	24.6	16	85	14	E quad.	285.7	8	Ci. NNE	Cu.-N. SE	35	☉ a. ☐ a. ☐ a. ≡ p.
27.	36.95	17.8	22.5	15.3	92.2	13.9	NE	208.7	7	Ci.	Cu.-N.	11.8	☉ a. ☐ a. ☐ a. ≡ p.
28.	37.26	17.6	23.5	15.4	91.5	13.6	E quad.	336.8	8	A.-Cu. E	Cu.-N. SE	58.5	☉ a. ☐ a. ☐ a. ≡ p.
29.	37.60	16.9	21.4	14.8	94.5	13.5	W quad.	277	9.7	A.-Cu.	Cu.-N.	24.9	☉ a. ☐ a. ☐ a. ≡ p.
30.	37.07	18.7	24.2	15.1	82.8	13.3	W quad.	306	7.7	Ci.-S. NE	Cu.-N.		☉ a. ☐ a. ☐ a. ≡ p.
Mean	636.72	18.9	24.4	16.1	86.7	14		309.1	7.6				
Total								9,271.9				406.5	

\*The barometric readings of this station are not reduced to sea level.

VIGAN.

[ $\phi=17^{\circ} 34' N$ ;  $\lambda=120^{\circ} 23' E$ ; barometer above sea, 14.7 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.	Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.			
	Pressure (mean).	Mean.	Maximum.				Minimum.	Prevailing direction.	Total movement in 24 hours.			Amount (mean).	Form and its direction.	
						Upper.							Lower.	
1.	758.24	28.8	33.7	24.5	78	W	156	3.3	Ci.	Cu.	NW	62.7	☉ <sup>2</sup> ☉ <sup>2</sup> p.	
2.	58.15	27.8	33.7	25.3	81.3	SE	174.3	4	Ci.	Cu.	WNW	3	☉ <sup>2</sup> ☉ <sup>2</sup> p.	
3.	57.45	28.6	32.8	25.1	79	Variable	155.4	2.7	Ci.-S.	Cu.	NE		☉ <sup>2</sup> p.	
4.	56.83	29	32.2	25.5	77.7	Variable	118.4	2.8	Ci.-S.	Cu.	SW, NW		☉ <sup>2</sup> p.	
5.	56.25	28.7	32.7	25.2	74.3	SE	169.2	2.7	Ci.-S.	Cu.	SSW	1.3	☉ <sup>2</sup> d ☉ <sup>2</sup> p.	
6.	56.86	27.5	31.5	25.6	79.7	S quad.	115.6	7.5	A.-Cu.	Cu.-N. S,	WNW		☉ <sup>2</sup> a. d ☉ <sup>2</sup> a. p. ☉ <sup>2</sup> p.	
7.	57.28	26.8	32.7	22.8	83.7	Variable	130.9	7	Ci.-S.	Cu.-N.	SW	36.6	☉ <sup>2</sup> a. ☉ <sup>2</sup> ☉ <sup>2</sup> p.	
8.	57.53	27.7	32.3	24.4	76.5	E quad.	169.5	3.2	Ci.-S.	Cu.-N.			☉ <sup>2</sup> p ☉ <sup>2</sup> p.	
9.	57.95	27.6	32.5	24.9	79.3	SW, ESE	164.5	7.2	Ci.-S.	NE	SSW	3.8	☉ <sup>2</sup> d p.	
10.	58.46	26.8	31.9	22.5	82.5	SE quad.	170.8	8.7	Ci.-S.	Cu.-N.	SSW	57.2	☉ <sup>2</sup> ☉ <sup>2</sup> d p.	
11.	57.92	27.5	31.3	23.4	78.8	SE quad.	140	8.3	A.-Cu.	SE	SSW	2	☉ <sup>2</sup> p.	
12.	57.70	28	32.1	23.9	78.3	SW	172	7.3	Ci.-S.	Cu.-N.	SSW	6.9	☉ <sup>2</sup> a. ☉ <sup>2</sup> a. p. ☉ <sup>2</sup> p.	
13.	57.81	28	32	24	79.7	Variable	160.4	5.7	Ci.-S.	Cu.-N.	SSW	11.9	☉ <sup>2</sup> ☉ <sup>2</sup> a. p.	
14.	57.57	27.6	32.7	23.3	80	Variable	196.1	6.7	Ci.-S.	Cu. NNE,	SSW	46.7	☉ <sup>2</sup> d p.	
15.	57.43	27.3	31.8	22.9	82.3	S quad.	252.2	7.7	Ci.-S.	Cu.-N.	SSW	24.9	d a. p. ☉ <sup>2</sup> p.	
16.	57.56	27.6	32	24.4	81.2	SSW	132.3	7.8	Ci.-S.	Cu.-N.	SSW	10.2	☉ <sup>2</sup> p.	
17.	58.02	28	32	23	82	Variable	142.7	6.3	A.-Cu.	SSW	Cu. SSW, SW	79.8	☉ <sup>2</sup> p.	
18.	58.93	27.6	32.2	24.9	83.3	SW quad.	134.6	5.8	Ci.-S.	Cu.	SW	17.2	☉ <sup>2</sup> ☉ <sup>2</sup> p.	
19.	59.90	28.1	32.1	24	75.2	SE quad.	179.5	4.8	A.-Cu.	NNE	Cu.-N.		d ☉ <sup>2</sup> a.	
20.	59.63	27.5	31.5	24	80.2	S quad.	183.6	4.3	Ci.-S.	Cu.	SW	4.3	d ☉ <sup>2</sup> ☉ <sup>2</sup> p.	
21.	58.49	27.8	31.5	25	80.2	SW, SE	203.7	3.7	Ci.	NE	Q. SW	4.3	d ☉ <sup>2</sup> p.	
22.	58.55	28	31.3	24.7	81.8	S quad.	220.2	3.7	Ci.-S.	Cu.-N., Cu.	ssw		d ☉ <sup>2</sup> a.	
23.	58.83	28.4	31.9	25.5	78.3	SE, SSE	225.7	2.5	Ci.-S.	Cu.	SSW		☉ <sup>2</sup> a.	
24.	59.02	27.4	32.7	24.3	80	SE quad.	200.7	5.2	Ci.-S.	Cu. SSE, WNW		1.8	☉ <sup>2</sup> d p.	
25.	59.44	27.2	32.6	23.7	77.2	SE quad.	206.3	5.5	Ci.-S.	Cu.	NNE	2.5	☉ <sup>2</sup> d p.	
26.	58.95	27.7	31.7	24.2	79.8	Variable	130.5	4	Ci.	NNE	Cu.		☉ <sup>2</sup> p.	
27.	58.57	28.2	32	24.8	76.3	SW	140.6	4	Ci.-S.	NE	Cu.	2	☉ <sup>2</sup> d p.	
28.	59.50	26.7	31.8	23.5	85.8	Variable	145.9	7	Ci.-S.	N.		37.6	d ☉ <sup>2</sup> p.	
29.	59.72	26.1	30.5	23.2	85.7	SSW	232.6	8.2	Ci.-S.	NE	Cu., N.	68.4	p ☉ <sup>2</sup> p.	
30.	58.74	27.1	31.2	22.7	80.2	SE quad.	163.1	5.3	A.-Cu.	SE	Cu.	13.5	☉ <sup>2</sup> p a. d ☉ <sup>2</sup> p.	
Mean	758.24	27.7	32.1	24.2	79.9	21.9		169.6	5.4					
Total								5,087.3					498.6	

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	<i>mm.</i>	<i>°C.</i>	<i>°C.</i>	<i>°C.</i>	<i>P. ct.</i>	<i>mm.</i>		<i>0-12.</i>	<i>0-10.</i>			<i>mm.</i>	
1.	758.61	29.6	38.4	23.8	71.2	21.4	SE	0.2	4.2	Ci.	Cu.	SE	0.0 a.
2.	58.19	30.1	39.6	24	69.5	21.3	NE	.5	2.3	Ci.	Cu.		0.0 a.
3.	57.43	30.4	40.3	25	70.3	21.7	S, N	1	1.3		S, Cu.		0.0 a.
4.	56.86	30.1	39.5	25.4	71.7	22	SE	1.2	6.7	Ci.	Cu.-N., Cu. s, sw		0.0 a.
5.	56.23	29.12	39.3	24.4	73.7	21.2	Variable	.5	4.2	Ci.-S.	Cu.-N. SW	1.8	0.0 a. [4.0] 0.0 p.
6.	57.14	27.5	37.4	23.6	79.8	21	S, SE	.3	7.3	Variable	Cu.-N. S	21.6	d a. p. [4.0] 0.2 p.
7.	57.75	27.6	35.8	23.4	80.8	21.8	S	.8	6	Ci.-S.	Cu.-N. SE, SW	1.2	1 d p.
8.	58.10	27.7	37.6	22.6	76.2	20.3	Variable	.8	4.5	Ci., Ci.-S.	Cu.-N. S, ENE	4.1	1 0 p.
9.	58.14	28.2	36.6	23.4	76.3	21.1	S, NW	.8	4.8	Ci.-S.	Cu.-N. SE	10.1	[4.0] 0.2 p.
10.	58.45	27.2	36.4	23	78.2	20.4	S, NW	1.2	7.7	Ci.-S.	Cu.-N. N	2.5	[4.0] d2 a. [4.0] 0 p.
11.	58.30	28.7	36.9	23.2	72.3	20.5	SSW	1	6.3	Ci.-S., A.-Cu. NW	Cu. S quad.		0.0 a.
12.	58.03	29.4	36.9	24	68.5	20	S	1.2	4.2	Ci.-S.	Cu. S quad.		0.0 a.
13.	58.14	29.2	38.4	23.4	69.8	20	S	1	3.8	Ci.-S.	Cu. SSE, SW	6.6	0 a. d 1 p.
14.	57.96	29.3	36.8	24.1	71.7	20.9	S	.8	6.5	Ci.-S.	Cu. SSE, S		0 a. 0 0 p.
15.	57.87	28.6	36.6	23.5	73.7	20.9	S quad.	1.5	6.5	Ci.-S.	Cu. SSE, S	6.8	1 0 d2 0 p.
16.	57.60	28.5	37.5	23	76.3	21.6	Variable	.8	6	Ci.-S.	Cu. S		0 p.
17.	58.21	29.2	38.6	22.5	72.2	20.9	Variable	1.2	5	Ci.-S.	Fr.-Cu. S, SSW	18.5	0 02 [4.0] p.
18.	59.15	28.5	36.9	22.7	74.8	21.2	Variable	1	5.3	Ci., Ci.-S.	Cu.-N. E, ESE	5.4	0 0 p.
19.	60.26	27.7	36.1	22	76.8	20.6	SE quad.	1.3	3.8	Ci.	Cu.-N. SE		0 a. d 1 p.
20.	59.54	28.2	36.6	23	76.8	21.3	Variable	.5	4.7	Ci.	Fr.-Cu. SSE, S		0 a. [4.0] p.
21.	58.30	28.6	37.3	23.2	74.8	21	SW quad.	1.3	3.8	Ci.-S.	Cu.-N. SE, NW		0 a. 0 p.
22.	58.37	27.3	37.3	23.2	77.8	20.6	S, SE	.3	4.7	Ci., Ci.-S.	Fr.-N. W	.8	p d2 p.
23.	58.85	28.6	37.5	23.1	72.2	20.4	SE, W	.3	2.5	Ci.-S.	Cu.		
24.	59.55	26.6	36.8	23.3	78.2	19.9	SE quad.	1	5.8	Ci.-S.	Cu.-N. E, NNW	3.6	1 0 p.
25.	60.10	27.2	35.2	22	80.2	21	S	.7	6.2	Ci.-S.	Cu.-N. SSW, E		0 a. 1 0 p.
26.	59.56	28.5	37	23.2	72.7	20.3	Variable	.7	4	Ci., Ci.-S.	Cu. S		0 p.
27.	58.71	28.8	38.1	23.7	70.8	20.1	Variable	1.2	5.2	Ci.-S.	Cu.-N. SE, SW	10.2	1 d 0 0 p.

*Meteorological data for first and second class stations—Continued.*

APARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.					Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.						
										Upper.		Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.		
1.	758.34	28.8	34	24.5	75.8	22.1	SE quad.		4	Ci.-S.	N	Cu.	S		☉ p.	
2.	58.02	29.3	34.2	24.9	75.5	22.6	E quad.	340.8	.3	Ci.	N	Cu.-N., Cu.			☉ p.	
3.	57.39	29.9	34.5	25	78.3	23	N, S	327.6	2.7	Ci.		Cu.-N.	N		☉ p.	
4.	56.78	28.3	32	25	81.5	23.2	N	314.8	2.7	Ci.-S.	W	Cu.-N.	S, N		☉ a. ☐ ☐ p.	
5.	55.86	28.6	34	24.6	79.8	23.1	S quad.		2.8	Ci., Ci.-S. W, SW		S.-Cu.			☉ a. p. ☐ ☐ p.	
6.	56.94	26.4	32	23.6	87.5	22.4	Variable		8.3	Ci.-S.	N	N.	SW	9.8	☉ a. p.	
7.	57.65	26.4	32.4	23.1	81.7	20.6	S	293.6	6.3	Ci.-S.	SW	S.-Cu.			☉ p.	
8.	57.74	27.8	34	23.5	76.3	21	S	361.4	4	Ci.-S.	N	Cu.-N.	SW		☉ p.	
9.	57.88	28.1	33.1	23.9	78.7	22.1	Variable	369.5	4.5	Ci.-S.	N	Cu.-N., Cu.-N.		4.8	☉ p.	
10.	58.33	27.2	33	23.1	80	21.4	S	395.7	8.8	Ci.-S.	S	Cu.-N.	SW, N		☉ a. < p.	
11.	58.11	28.3	33.5	23.4	77.3	21.5	S	343	6.3	Ci.-S.	N	S.-Cu.			☉ p.	
12.	57.81	28.7	34	24	76.5	22.2	N quad.	424.6	5.7	Ci.	N	Cu.	S		☉ p.	
13.	57.94	28.8	33.8	24.6	75.8	22.2	N	347.9	4.7	Ci.	NE	Cu.-N., Cu.	S		☉ p.	
14.	57.79	28.5	33.6	24.1	78.3	22.2	N quad.	351.1	5.7	Ci.-S.	E	Cu.-N., Cu.	S		☉ p.	
15.	57.44	28.5	33.6	24.6	76.8	22.1	SW	422.6	7.2	Ci.-S.	E	Cu.-N., Fr.-Cu. W, S		.8	☉ p.	
16.	57.63	28.3	33.6	23.6	78.8	22.4	Variable	291.1	7.3	A.-Cu.	E	S.-Cu.	E		☉ a. ☐ ☐ p.	
17.	58.11	28.6	32.8	25	80	23.1	SW	332.9	4.2	Ci.		Cu.-N.	SW	3	☉ a. p. ☐ ☐ p.	
18.	59.08	28.1	33.4	23.2	79.8	22.4	S	425.3	4	Ci., A.-Cu. E, W		S.-Cu.		3.8	☉ a. ☐ ☐ p.	
19.	60.13	27.7	33.4	22.1	80.3	22	Variable	341.2	3	A.-Cu.		Cu.-N.			☉ a. < p.	
20.	59.18	27.8	33	24	80.3	22.2	N	376.7	7	Ci.	NE	Cu.-N.	NW		☉ p.	
21.	57.91	28.2	33.7	23.8	77.2	21.9	S	395.3	1.2	Ci.	E	Variable			☉ p.	
22.	58.06	27.4	34.2	23.6	78.2	21	S	270.7	5.5	Ci.-S.	SW	Cu.-N., Cu.		4.1	☉ a. ☐ ☐ p.	
23.	58.30	28.5	33.5	23.6	76.8	22.1	S	292.1	2.8	Ci.	E	Variable			☉ p.	
24.	59.53	27.1	33.8	22.4	81.5	21.6	S	325.7	5	Ci.-S.	E	Cu.	S	26.1	☉ a. ☐ ☐ p.	
25.	59.80	27.6	33.4	23	80	21.9	ENE, S	295.5	5	Ci.-S.	E	Cu.-N., S.-Cu.			☉ p.	
26.	59.44	28.5	33	24.6	78.7	22.6	Variable	294.1	4.3	Ci.-S., Ci. W, NE		Cu.			☉ a. ☐ ☐ p.	
27.	58.51	28.4	33.1	24.1	80	22.8	Variable	268.8	3.2	Ci.-S.	E	S.-Cu.			☉ a. ☐ ☐ p.	
28.	59.41	27	33.5	24.1	82.7	21.8	S	351.2	5.7	Ci., A.-Cu. E, SE		Cu.-N.	SW	70.4	☉ a. ☐ ☐ p.	
29.	59.26	27	31.5	23.4	84.5	22.2	Variable	346.4	7.5	Ci.-S.	E	Cu.-N.	S		☉ p.	
30.	58.50	28.4	32.4	24.1	79.8	22.6	E quad.	245.2	8.7	Ci.	NE	S.-Cu.		1.3	☉ a. < p.	
Mean	758.23	28	33.3	23.9	79.3	22.2		338.7	4.9							
Total														124.1		

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, JUNE, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan	43.9	10.4	.1	21.9	74.4	33.2	14.5	(a)	(a)	69.3	(a)	.8	3	3.8	17.2	4.8
Zamboanga	5.8	5.4		8.6	12.7	2.3	4	7.4					3	2.5	24.2	9.6
Davao	10.2	4.1		9.1	4.1											
Cotabato	4.3	26.7		30		53.8		14.5		10.4	1.3		10.2		9.7	
Cagayan, Misamis	12.7	.8	.3	22.4	1	46.7	.4	8.4	50	.4		2	7.1	30.5	7.9	.1
Butuan		1	2.8	.8	3	37.3	15.2						15.7		1.5	11.7
Dumaguete	.5	29.7	9.4	24.9	.5	17		.6	3.6		.5		5.3	4.1	1.5	4.8
Yap, W. Carolines	72.4	12.4	.5	3.8	16.8	3.6		7.1	12.4				8.7		2.8	4.4
Maasin	9.6	5.6		21.1	1.1			12	7.7	.5			2.8	6.1		
San José Buenavista	21.8														16.5	
Cuyo			2.3	.5	9.7	46.7	52.8	.8		.3		10.4		5.3	.8	9.4
Guiuan		1			8	1		20.9		41.4		3.8	.8			1.5
Borongan	.3	20.6		1.5	2	20.6	25.7	8.1		.5		7.4		.5	32.3	
Masbate	8.1	20.1	5.3	11.2	9.7	4.3	1.6	.3			8.4	.8	1.5	2.8	11.2	.3
Romblon	.8		.8												.8	
Batag	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	7.9			1.3
Gubat	16.8	2.5				1.5	1.3								2.3	
Sumay, Guam	4	2.6			2.8									17.8		
Calapan												10.2		3.8	9.5	4.5
Virac	9.7		7.1	.5	1.8	2.3	20.6	1.5	5.8	.8			.5			10.9
Nueva Caceres	4.9	8.1			1.8	4.3	18.8	13.8		2.8	.8	11.9			.5	
Batangas	3.7			15.5	7.1		.8	2.5	17.9				5	4.2	16.5	13.8
Silang					7.9			9.7							.5	
Santa Cruz, Laguna			42.2	4.8			1.8								1.8	6.1
Antipolo			4.1	7.1					19.8	4.6					49.5	15.2
Iba			11.8	10.9			37.9	18.6		.2	1.5	97.3	.5		9.8	4.6
Tarlac				23.4	1		25.4	2.8	15.5					1		
Baler				29.7	3.3	6.6	1	.5	2.3					14.7		31.7
San Fernando, Union				19.8		1.5	8.4	29.7	3.3	2.8	.3	14.5	5.1	.8		36.1
Echagüe			1													
Candon					3.6	16.8	1.8	20.1	1.8	21.6	33.5	9.4	42.9	75.2	24.1	1.5
Laoag	17.8					31.2	22.1		18.3	45.7	.5		33.5	17.8	45.7	
Santo Domingo, Batanes					25.9	15.5	3.3				3					

Station.	Day of month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.			
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan	38	5.1	1.3	19	3.3	8.4	5.1	5.8		6.6	6.6	1	5.3	6.6	8.9	354.9	
Zamboanga	13.2			2	2.3	27.7	23.7	12.7		.8	1	3	3		35.6	258.9	
Davao		5.4		4.3						1.5	1				9.4	124	
Cotabato			1.8	1.3			12.7	21.6		3.6		4.3			9.4	215.6	
Cagayan, Misamis	1.5		11.7	37.6		.3	3.6	2		2					1	250.4	
Butuan	4.3			7.1		.8	.8	7.4	6.6		14.5	2.5				132.2	
Dumaguete	15.2			.5		6.9	.3	18.5	31.7	40.9	.3		1.5		1	219.2	
Yap, W. Carolines						4.6			1.5	7.9	5.6	24.4	5.6	2.9		197.4	
Maasin						5.1	.3		.3	4.6		6.9		.5		87.4	
San José Buenavista		.8	11.2	.3		2			5.1						45.4		
Cuyo																	
Guiuan	1.3		1.5	2.8	1.8			6.6	4.3	3.3	4		2.5	.3	16	181.7	
Borongan		3.8	.5	.8	3.8			6.6	4.3	39.4			5		22.1	154.4	
Masbate		1.3		3.3				4.8	9.4	5.3	14.5	54.9	8.4	16.2		241.9	
Romblon								.3	5.4	33	.5	2.3	2.3	.8		133.8	
Batag								4.1	1.5		.5	4.6			34		
Gubat	4.3	8.9		64.2	2.3		19.9	19.8	1.3		83	8.9	5.8		207.7		
Sumay, Guam				1.3	2				2.8	22		31			83.5		
Calapan						9.4	1.8	1.8	1.3		12.2				53.7		
Virac	7.7		3.8	1.2	5.7	.6	2.5		1.3	5.7	8.3	2.5			68.6		
Nueva Caceres									23.9	1.3	17.7	31.5		3.8	148.3		
Batangas			2.3	32	1.1		.8	1.8	64.2	19.6	34.3	6.8		.3	196		
Silang	5.3	5.1	16.8	22.9	15.2		3.8	10.9	.5	.5	6.6			62.2	212.4		
Santa Cruz, Laguna			.5								1	2.3		.5	19		
Antipolo	5.3		25.4								35.1	3.3			141.9		
Iba	52.8	6.1	8.4								21.8	25.4		7.4	151.9		
Tarlac		1.6	.1								28.7	27.7		15.2	228.6		
Baler	64.8	4.8			9.4	50	17.8	3.7			1.7	117.3	.1	2	313.2		
San Fernando, Union	2							2	2.3	4.6	1.8	3.8	1.3		276.6		
Echagüe	33	106.2		3.3			.3		.5			2	24.2	23.1	108.9		
Candon		.5	11.7	11.2	12.2	2	19.8					3			815.7		
Laoag	14.7	3.8						50	8.9			98.8	7.1	9.4	70.8		
Santo Domingo, Batanes	6.4	5.6		6.6		.2	1.3	.3	6.1			10.2	9.7	5.6	282.8		
				1.8					1.3			5.6	.8		59		

\* No observation.

## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, JUNE, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Butuan.		Dumaguete.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30.8	22.3	31.7	22.6	30.6	23.6	31.9	22.2	33.8	23.4	33.4	22.5	30.1	23.6	31.5	24.5
2	29.9	22.6	30.1	22.7	29	23.5	32.1	23.5	34	23.8	33	23.7	31	24.3	31.1	26.6
3	30.4	23.3	32.6	23.9	30.7	23	32.2	22.8	33.8	23.4	31.7	23.4	29.7	23.4	29.3	22.3
4	28.2	22.1	30.1	22.1	29.6	23.9	31	22.8	33.2	23.6	31.7	22.4	30.6	23.8	31.2	23.9
5	32	21.9	31.6	23.3	30.5	23.5	32.6	21.9	33.8	23.4	33	23.8	30.6	23.4	30.5	25.7
6	29	22.3	31.6	23.6	28.5	24	31.2	22.9	34.5	23.2	32.3	23	28.7	24.4	30.4	24.7
7		22	31.6	23.6	32.4	23.9	32.7	20.7	33.2	22.4	31.3	22.9	29.3	23.6	30.4	22.9
8			30.8	22.5	30.4	24.3	32.9	21.9	34.1	23	31.3	22	29.7	23.7	30.7	24.8
9			30.2	22.6		23.1	29.7	23.2	30.8	23.1	31.6	22.8	31.7	23.6	31	25.2
10			31.1	22.1			30.4	22.5	31.9	23.2	31.8	24.27	31.4	23.7	30.7	23.9
11			30.6	22.6			30.7	22.5	32	22.9	29.2	22.8	29.6	23.7	29.8	23.6
12			31.1	22.1	30.1	23.4	31.7	23.1	32.6	23.9	31.4	23.4	30.6	23.9	31.8	22.8
13			30.8	22.5	29	23.9	32.2	22.1	33.8	22.8	32.9	23.4	32.1	24.3	31.3	23.1
14			32.1	21.5	30.6	22.9	31.6	22	32.9	22.2	31.5	22.7	29.5	23.9	30.8	24
15			31.1	23.1	30.4	23.5	28.7	22	31.8	22.9	31.8	23.5	28.7	23.1	30.6	22.7
16	28.3	21.77	28.4	23.3	28.4	23	30.7	22	29.9	22.3	31	23.2	29.5	23.8	30.3	24
17	31.7	21.2	31.2	22.6	30.5	23.1	29.7	22.3	32.8	22.6	31.8	22.9	29.7	23.2	30.7	23.6
18	33.3	22	32.8	22.6	30.7	23	32.2	22.3	33.5	21.9	31.9	22.2	31.7	22.7	31.7	23.2
19	29.5	22.5	31.1	22.4	30.3	23.5	32	22	34.4	22.7	32.1	21.9	32.2	23.7	31.3	23.6
20	31.6	21.8	31.1	21.9	29	22.9	32.7	23	32.2	23.3	31.7	22.9	32.8	23.1	31.8	23.9
21	29.4	22.1	30.6	21.1	28.1	22	28.3	22.8	31.7	21.7	31	23.8	30.6	23.8	30.8	24
22	30.9	21.4	30.4	21.5	29.4	23.1	32.2	21.2	33.2	22.9	32.1	23	33	24.4	32.5	23
23	31.4	22.7	30.2	21.9	29.9	23.3	32.7	21.9	32.4	22.7	32	22.2	31.7	23.7	31.5	22.9
24	31.2	21.4	31.4	21.9	30.3	23	27.2	21.9	30.8	22.6	30.5	22.5	27.3	23.1	31.3	23.3
25	32.3	21.4	31.6	21.3	30	23	31.1	21	32.4	21.3	30.8	21.2	30.3	22	30.5	22.5
26	31.4	21.6	32.2	21.6	31.1	22.5	32	21	33.2	22	31.4	21.5	31	22.3	30.2	25.8
27	32	21.7	30.8	22.3	31.1	23.1	31.57	21.5	34.1	22.6	31.7	23	30.8	23.3	30.3	23.6
28	30.8	22.3	30.8	21.9	31	24	32.7	22.4	33.9	23.4	31.7	23	31.8	23.4	31.2	24
29	31.5	22.2	31.4	23.3	30.6	23.5	33.2	22.1	34.8	22.7	31.9	22	31	23.7	31	23.7
30	31.8	21.6	30.6	22	29.9	24	32.2	22.8	35.7	23.4	32.3	22.4	30.6	23.6	32	24.2
Mean	30.8	22	31.1	22.4	30.1	23.3	31.4	22.2	33	22.8	31.7	22.8	30.6	23.5	30.9	23.9

Day.	Yap, Western Carolines.		Maasin.		San José Buenavista.		Cuyo.		Guiuan.		Borongan.		Masbate.		Romblon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	31.9	24.9	34.1	24.7		23.8	32.6	26.7			31.5	22.5	33	26.5	33.2	25.2
2	32.3	25	33.4	24.4		23.7	32.5	27.6			31.9	25	33.6	26	34.8	26.6
3	30.8	24.1	33.5	22		24.5	29.6	26.6			31.3	23.4	31.2	27	30.7	24.1
4	31.8	25.4	33.5	23.6		23	33.1	24.5			31.3	23.7	31	26.2	34	23.8
5	31.7	25.5	33.5	22		24.7	31.4	25.4			31.5	21.47	33.5	26.5	33.5	24
6	31.2	23.9	33.4	23.4		24.5	30.5	23.9			31.4	23.5	31.8	25.8	32.2	23
7	32	25	33.6	25		23.6	31	24.4			31.6	21.22	33.2	26.2	34.6	25
8	31.9	26	33.5	25.2		23.5	30.2	24.8			31.9	24.5	33.2	26	34.7	26.3
9	32	25	32.8	25		24	32.7	24.6			31.8	22.4	33.2	25.8	34.8	24.1
10	30.7	25.9	32.6	24.6		24.3	30.8	24.6			31.8	22.8	33	26.5	33.1	23.7
11	32.2	24.7	32	24.4		24.4	31.1	24.6			31.3	22.1	32.4	25.4	33	23.7
12	32.4	25.2	32.6	24.4		23.6	30.7	24.6			31.3		33.2	25.8	33.7	23
13	32.3	25.4	31.8	24.4		24.4	29.7	22.5	31.6	24.5	30.7		32	25.8	33.7	23.5
14	31.7	25.7	31.9	24.8		24	32.2	25.2	30.7	25.2	31.6	23.1	30.5	26	34.7	23.5
15	32.4	26	31.3	24		24.4	31.7	24.8	31.7	24.2	31.3	23.2	32.5	26.4	33.8	23.4
16	32.3	25.5	31.4	23.8		24	31.6	24.8	31.7	24.5	31.1	24.5	33	26	34.7	24.3
17	32.9	24.5	31.5	23.6		23.4	31.6	24.7	32.1	25.8	32.1	23.6	33.4	25.6	33.1	23.9
18	33.2	24.8	31.9	24.7		23.6	32.3	24.8	30.8	24.6	32	23.2	34.4	26.4	34.7	23.6
19	33.4	26.2	32.5	24.8		24	32.4	24.8	31.4	24.3	32.1	22.8	32.5	26	34.2	24.4
20	33.1	24.5	32.2	23.8		22.5	33	24.3	32	24.3	32	22.7	32.2	26.5	34.1	23.5
21	33.9	25.2	34	24		23.1	33	25	32.7	24.2	32	23.3	30.5	26.8	34.7	23.9
22	33.8	25.2	32.7	24		23.5	33.2	24.1	31.5	24.4	32.2	22.2	34	25.5	34.4	22.9
23	33.4	26.3	34	24.9		23.5	32.4	25	31.2	24.3	32.6	23.6	32.8	26.2	34.8	25.4
24	32.5	23.9	33.6	24.9		23.7	31.4	24.2	31.8	24	32.2	23.2	32.5	26.5	35.3	24.1
25	32.8	24.1	31.7	22.7		23.3	31.2	23.4	31.5	22.5	31	21	30.6	25.2	34.7	23.2
26	32.9	25.2	32	22.7		23.1	31.9	24.3	31.7	23.5	31	22	32.5	25.5	34.3	23.4
27	32.8	25.1	31.5	22.7		22.6	30.9	23	30.2	23.9	31.4	21.2	31.4	25.6	34.3	23.8
28	32.9	24.6	32.6	22.7		23.5	30.6	24.3	31.8	23.8	31.6	23.5	28.5	24.5	32.2	23.3
29	32.7	25.5	32.8	24.4		22.9	31.1	24.6	31.9	23.6	31.5	22.3	34.2	25.5	34.5	23.5
30	33	25.1	33.2	24.2		23.4	33.2	24.4	31.4	24.3	31.9	22.5	31.8	26.4	35.1	23.6
Mean	32.4	25.1	32.7	24		23.7	31.7	24.7	31.5	24.2	31.6	22.9	32.4	26	34	24

Maximum and minimum temperatures for third-class and rain stations, June, 1913—Continued.

Day.	Batag.		Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30.9	22.67	32.7	24.2	31.9	26.1	32.1	23.1	31.2	24.2	34.7	21.2	35.6	24.7	30	19.5
2	30.6	23.9	32.2	24.6	32.2	26.4	32.6	25	32	22.2	33.5	20.7	36.4	24.4	30.9	20
3	29.9	23	31.2	25	31.9	26.3	32.5	23	31.1	23.5	33.5	20.8	35.3	24.5	31.3	19.4
4	30.2	23.8	32.5	26.3	32.3	24.8	32.6	24	32.5	23.8	34.3	20.7	35.2	25.5	31	19.8
5	30.3	23.7	32.1	24.5	32.3	26.3	32.6	22.7	31.8	23.9	34.6	21.6	35.8	24.2	31.6	19.4
6	30.5	22.7	32.5	24.2	32.2	26.3	31.1	23.6	31.5	24.1	33.7	23	33.3	25	32	19.1
7	30.5	22.9	32.6	24.8	32.2	25.2	31	23	31.4	23	34.5	22.3	31.8	24.2	31.5	19.2
8	31	22.9	33.2	24.8	30.3	25.7	33.5	22.3	31	23.9	33.9	21.6	33.5	24	31.3	19.6
9	31.3	23.4	34.3	23.1	32.4	25.7	32	22.6	31.9	22.6	34	20.5	35.3	24.3	30.4	20.1
10	31	23.4	34	24.2	31.7	25.8	32.3	22.2	32	22.4	34.6	21.5	35.2	23.5	30.9	19.8
11	31.5	23	34	22.5	32.3	25.8	32	22.5	32.8	22.6	34.5	21.1	34.8	24.2	31.5	20
12	31.5	23	33.6	24.3	32.8	26.2	32.5	23.2	32.1	22.4	35.4	21.5	34.9	24.4	31.2	20.5
13	30.5	23.6	33	25.3	32.2	26.6	32.4	22.7	32.5	22.5	34.6	21.4	35.8	23.8	31.7	20.3
14	31	23.4	33.4	23	32.4	26.2	32.5	21.9	32.7	24	34.6	21.6	34.9	23.6	32	19.5
15	31	23.1	33	23.9	30.8	24.3	32.6	22.7	32	24	35	22.5	33.7	24.4	31.7	20
16	31.4	23.2	32.7	24.6	30.8	25.4	32.7	22.5	32.5	23	34.4	22.1	34	23.5	31.9	19.1
17	31.8	22.9	33	23.6	28.6	24.3	32.5	23.2	33	23.4	33	22.2	33	23.6	30.1	19.5
18	31.9	23.4	33.4	23.9	31.3	25	32.5	22.6	33	23.2	34.2	22.1	33.9	24	29.3	20
19	32.4	23.4	32.9	23.6	30.8	25.2	31.5	23.9	34.1	23	35.7	21.8	32.8	24.9	30.7	19.1
20	32.5	22.9	33.2	23.5	30.8	24.4	32.2	21.5	32.9	22	35	21.5	33.8	22.2	30.9	20
21	31.5	22.7	33.5	23.8	30.4	24.9	32.6	21.7	32.9	22	35.3	21.9	34.4	23.1	30	20.3
22	33.3	22.5	34.7	23	32.2	25.2	32.6	22.2	34.5	21.5	34.6	22.4	33.9	24	29.6	20.2
23	33.6	22.6	34.3	24	31	26.4	32.6	22.5	35	23	34.8	22.8	34.3	24.2	30.2	19.7
24	32.4	23.4	33.5	23.7	30.9	25.4	32.5	22.9	34.4	22.8	35.5	21.5	33.8	24	29.1	19.3
25	32.4	22.4	31.2	23.8	31.2	25.4	32.8	22.6	27.6	22.2	30.8	21.5	32.9	23.2	28.7	19
26	31.4	22	32.5	23.6	30.2	24.7	32	22.8	31	21.8	32.7	20.7	32.6	22.4	29.7	18.5
27	31	22.5	32.3	23.4	31.2	25.8	32	22.8	31	22	33.9	20.7	32.3	23.5	29.6	19.1
28	30.9	21.8	31.5	24.7	31.2	24.7	31	21.5	28.6	21.8	31.5	21.2	32.8	22.5	28.2	19.5
29	31.2	22	32.3	23.5	30.8	25	31.5	22	31.5	21.6	34	20.6	33.8	23	28.6	20
30	31.5	23.9	33	24.8	31.6	24.5	32.7	22.2	32	21.7	34.2	21.8	33.7	22.7	30.3	20.2
Mean	31.4	23	32.9	24.1	31.4	25.3	32.3	22.7	32.1	22.8	34.2	21.6	34.2	23.8	30.5	19.7

Day.	Sta. Cruz, Laguna.		Antipolo.		Iba.		Tarlac.		Baler.		San Fernando, Union.		Echagüe.		Candon.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	35	23.9	36.3	23.5	35.1	23	35.8	22	33.2	23.2	35.2	24.6	37.7	22.4	31.8	25.1
2	35.2	24	37.1	22.7	33.4	22	36.9	21.8	22	34.8	23.9	33.3	20.9	31.9	25	25
3	35.2	24	36.8	22.7	33.1	23.3	38	21.8	22.3	33.7	24.3	39.9	21.9	32.2	25	25
4	35.4	24.2	37.1	24.3	33.6	24	36	24.2	23.6	32.5	22.9	39	23	32.4	25	25
5	33.5	25.1	37.2	23.4	32.4	22.7	35.8	22.4	24	34.8	22.5	38.4	22.7	32.6	25.8	25.8
6	33	23.8	34.6	23.5	32	23.5	33	23.6	23.7	32.1	22.5	37	23.4	30.2	25.8	25.8
7	32	23.9	33.9	23.8	32.5	23.3	32.7	22.5	23.2	34.9	22.5	37.3	22.7	31.4	25	25
8	34	24	35.8	23.7	33.7	22.6	34.8	22.5	34.7	23	32.4	23	37.8	22.4	31.4	24.5
9	33.7	24	36.8	22.8	32.2	23	33.9	22.6	32	23.2	32	22.4	38.3	22.4	32.2	24.5
10	33.2	23.5	34	22.8	31.8	24	33	23.6	31.9	24	30.7	21.2	37	23.3	31.4	25.7
11	34.3	22.6	34.3	22.4	32.2	24.3	33.6	23.3	31.9	23.4	34	24.7	37.3	21.4	30.7	24.4
12	34.8	23.6	34.7	22.5	32.9	23.5	33.5	23.2	31.9	23.1	33.5	25.37	36.8	20.8	31.7	25.6
13	35.1	23.5	35.4	23.5	31.6	22.6	33.6	23.6	32.2	23	34.8	25.3	39	20.7	31.9	24.5
14	34.9	22.5	35.8	23.8	33.8	24.5	34.3	23	32.3	24.4	34.5	25.3	36.8	22.4	31.9	24.2
15	34.2	23.6	33.6	22.3	32	23.2	34.5	23.5	32.6	24.3	33.5	24	36.9	23.1	30.8	24.2
16	35.1	22.5	35.3	23.3	31.9	23.5	34.5	23.1	33.8	24.3	33.4	24	39	23.1	31.6	25.5
17	33.5	22.5	33.1	22.7	31.8	24.5	34.5	23.7	32.2	24	32.4	22.8	39.6	22.8	31.4	26.1
18	32.7	23.4	33.4	21	32	23.5	33.1	22.2	33.2	23.9	31.2	21.7	38.3	22.7	30.9	25.1
19	31.6	23	33.2	22.9	33	24	35	22.7	34.5	23.8	30.7	21.4	37.3	21.7	30.9	24.5
20	33.5	21.2	33	21.8	32.4	22.1	35	22.5	34.5	23.3	32.2	22.9	37.3	23	31.4	24.2
21	34.5	22	33.3	22.2	32.3	22.5	36.2	22	34.5	23	33.1	23.7	37.8	22	32.3	25
22	33	23.6	32.9	23.4	32.5	22.5	36.5	22.8	36	24.5	32	22.6	36.7	22	31.9	26
23	33.8	23.6	33.2	23.6	32.7	23.3	35	23.1	36.4	23.8	33.7	24.4	36.7	23.2	32.4	25.5
24	34.9	23	33.9	23.4	32.8	23	35.3	22.5	37	23.3	30.6	21.9	34.7	22.4	32.5	26
25	33.1	23.6	34.3	23	33	23	34	22.9	30.5	23.1	33.1	23	33.8	22.1	31.4	23.7
26	34.2	22.6	33.5	22.4	33	22.7	35.2	22.5	32.1	22.3	33.6	23	35.6	22.3	30.7	23.6
27	33.2	22.6	32.1	22.7	32.5	22.8	35.7	22.5	32.4	23.3	34.1	23	35.1	22.2	31	24.9
28	32.4	22.7	30.7	22.1	32.4	22	33.2	22.9	29.4	23.6	25.8	23	35.3	23.2	30	25.4
29	32.4	23	32.3	22	32.3	22	31.4	22.4	31.3	22.8	32.5	22.4	34.8	22.7	30.8	23.8
30	33.1	23	33.2	22.7	32.5	22	34.9	22.3	33.2	22.7	31.4	20.9	37.1	22.5	30.4	24.4
Mean	33.8	23.3	34.4	22.9	32.6	23.1	34.6	22.8	33.1	23.4	32.9	23.2	37.3	22.4	31.5	24.9

*Maximum and minimum temperatures for third-class and rain stations, June, 1913—Continued.*

Day.	Laoag.		Sto. Domingo, Batanes.		Day.	Laoag.		Sto. Domingo, Batanes.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.		°C.	°C.	°C.	°C.
1.....			32.9	25.5	17.....		25.9	33	25.8
2.....			33	25.6	18.....		24.8	33	25.2
3.....			32.3	26.1	19.....		24.5	31.7	25
4.....			31.7	24.5	20.....		24.5	30.8	24.8
5.....	32.9		31.9	25.4	21.....		24.4	31	26
6.....	33.3	25.2	30.6	24.8	22.....		24.4	31	25.7
7.....	32.4	24.7	31.5	23.5	23.....		24	31	25.8
8.....	32.3	23	31.9	25.6	24.....		33.7	24.4	32.1
9.....	33	24.1	31.8	25.9	25.....		34	23.9	33
10.....	32.4	23.4	31.7	25.6	26.....		32.5	23.9	32.9
11.....		22.6	32	23.8	27.....		32.9	24.8	33
12.....		23.9	32.5	24.1	28.....		32	24.2	33.3
13.....		24.3	31.9	25	29.....		32.1	23.1	32.2
14.....		23.1	32.5	26	30.....		31.8	23	31
15.....		23.1	31.5	25.6					24.4
16.....		24.1	32.5	25	Mean.....	32.7	24	32	25.2



# SEISMOLOGICAL BULLETIN FOR JUNE, 1913.

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## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

1, 0<sup>h</sup> 38<sup>m</sup> 41<sup>s</sup>\* [1, 8<sup>h</sup> 38<sup>m</sup> 41<sup>s</sup>]. Pandorocan (S Mindoro). Earthquake of intensity III.  
1, 2<sup>h</sup> 02<sup>m</sup> [1, 10<sup>h</sup> 02<sup>m</sup>]. N Luzon. Earthquake of intensity III, felt in the Province of Ilocos Norte and in the northern part of the Mountain and Cagayan Provinces. Its origin was in the central Cordillera.

8, 2<sup>h</sup> 00<sup>m</sup> [8, 10<sup>h</sup> 00<sup>m</sup>]. Cuyo Island. Oscillatory earthquake, direction N-S, intensity III, duration 3<sup>s</sup>.

8, 21<sup>h</sup> 15<sup>m</sup> [9, 5<sup>h</sup> 15<sup>m</sup>]. Butuan (N Mindanao). Subsultory earthquake of intensity II-III and duration 2<sup>s</sup>.

10, 22<sup>h</sup> 51<sup>m</sup> 20<sup>s</sup>\* [11, 6<sup>h</sup> 51<sup>m</sup> 20<sup>s</sup>]. Butuan (N Mindanao). Oscillatory earthquake, direction E-W, intensity IV and duration 7<sup>s</sup>. It is affirmed that during the previous night another slight shock was felt. The origin of these earthquakes was probably in the Pacific at a short distance from Butuan, for the slow horizontal character of the movements seem to point to this; the shocks must have been perceptible on the Surigao coast.

12, 2<sup>h</sup> 16<sup>m</sup> 16<sup>s</sup>\* [12, 10<sup>h</sup> 16<sup>m</sup> 16<sup>s</sup>]. Butuan (N Mindanao). Oscillatory earthquake, direction ENE-WSW, intensity III-IV and duration 5<sup>s</sup>.

13, 7<sup>h</sup> 34<sup>m</sup> [13, 15<sup>h</sup> 34<sup>m</sup>]. SE of Luzon. Earthquake of intensity III-IV felt in the eastern part of the Province of Albay and in the Province of Sorsogon; its origin appears to have been to the north of the St. Bernardino Strait.

17, 3<sup>h</sup> 02<sup>m</sup> 09<sup>s</sup>\* [17, 11<sup>h</sup> 02<sup>m</sup> 09<sup>s</sup>]. Batangas (S of Luzon). Oscillatory earthquake, intensity III, direction SE-NW, duration 8<sup>s</sup>.

17, 11<sup>h</sup> 13<sup>m</sup> [17, 19<sup>h</sup> 13<sup>m</sup>]. Butuan (N Mindanao). Earthquake of intensity II-III. There was a repetition of the same intensity at 21<sup>h</sup> 25<sup>m</sup> [18, 5<sup>h</sup> 25<sup>m</sup>].

19, 6<sup>h</sup> 20<sup>m</sup> [19, 14<sup>h</sup> 20<sup>m</sup>]. Butuan (N Mindanao). Oscillatory earthquake, direction WNW-ESE, intensity III, duration 3<sup>s</sup>.

22, 11<sup>h</sup> 26<sup>m</sup> 36<sup>s</sup>\* [22, 19<sup>h</sup> 26<sup>m</sup> 36<sup>s</sup>]. Butuan (N Mindanao). Oscillatory earthquake, direction E-W, intensity III-IV, duration 35<sup>s</sup>, with two distinct series of shocks. Its origin seems have been in the Pacific.

25, 9<sup>h</sup> 10<sup>m</sup> [25, 17<sup>h</sup> 10<sup>m</sup>]. Surigao (NE Mindanao). Oscillatory and subsultory earthquake, direction ENE-WSW, intensity IV, duration 6<sup>s</sup>.

25, 20<sup>h</sup> 20<sup>m</sup> [26, 4<sup>h</sup> 20<sup>m</sup>]. Butuan (N Mindanao). Oscillatory and subsultory earthquake, direction WNW-ESE, intensity III, duration 4<sup>s</sup>.

27, 15<sup>h</sup> 08<sup>m</sup> 07<sup>s</sup>\* [27, 23<sup>h</sup> 08<sup>m</sup> 07<sup>s</sup>]. Iloilo (SE of Panay). Earthquake of intensity III. Its origin was very probably in the interior of the island to the NW of Iloilo.

27, 18<sup>h</sup> 14<sup>m</sup> [28, 2<sup>h</sup> 14<sup>m</sup>]. Island of Cuyo. Oscillatory earthquake, direction E-W, intensity III.

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observers who sent the report. All time indications are in Greenwich mean time (Midnight=0<sup>h</sup>), insular time being added in brackets for the convenience of Philippine readers.

## RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0h. Instrument: Wiechert seismograph: 1,000 kilograms.  $A_N$ :  $T_0=6.2$ ,  $\epsilon=2.21$ ,  $r=0.055$ ;  
 $A_E$ :  $T_0=6.4$ ,  $\epsilon=2.64$ ,  $r=0.034$ . Alluvium. 2.40 meters above sea level.]  $\frac{r}{T_0^2}$

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
205	1	Iv	eP L M <sub>E</sub> M <sub>N</sub> F	h. m. s. 0 38 41 38 56 38 58 39 16 49	1 1-2	825 473		Pandorocan (S of Mindoro).
206	4	IIr	eP eS eL M <sub>N</sub> M <sub>E</sub> F	10 03 30 09 27 15 08 19 54 21 09 11 53	7-8 11	149 150		
207	6	I	e F	2 47 54 3 12				
208	6	Id	eP L M <sub>E</sub> F	5 46 29 46 47 46 49 50	1	68		
209	6	Id	eP L M <sub>E</sub> F	20 32 08 32 14 32 16 35	1	125		Butuan (N of Mindanao).
210	7	I	e F	14 28 40 50				
211	9	Id	eP L F	6 57 34 57 49 7 00				
212	10	Ir	eP S L M <sub>N</sub> M <sub>E</sub> F	22 51 20 53 32 54 51 55 24 56 34 23 25	9 9	21 22		
213	10	Id	eP L F	23 39 45 40 03 43				Butuan (N of Mindanao).
214	11	Ir	e M <sub>N</sub> M <sub>E</sub> F	6 03 00 11 11 14 48 53	7-8 7-8	23 27		
215	12	Iv	eP L M <sub>E</sub> M <sub>N</sub> F	2 16 16 18 20 18 47 19 25 33	11 8	45 21		
216	12	Id	eP L F	22 46 21 46 37 50				
217	14	I	e F	8 55 9 31				End overtaken by following earthquake.
218	14	Iu	e L M <sub>E</sub> F	9 58 10 19 24 38 11 04				
219	17	Id	eP L	2 59 31 59 42				
220	17	Iv	eP L M <sub>E</sub> F	3 02 09 02 18 03 08 08	4-5	30		
221	17	I	e F	9 09 09 27				Batangas (S of Luzon).
222	18	Id	eP F	8 46 28 9 03				
223	18	I	e F	21 46 15 22 39				

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
224	19	I	e F	<i>h. m. s.</i> 3 08 10				Butuan (N of Mindanao).
225	19	Id	eP F	20 59 14 21 01				
226	22	Iv	eP F	11 26 36 41				
227	22	Iu	e S L M <sub>N</sub> M <sub>E</sub> F	14. 00 33 08 30 16 18 17 50 20 25 15 34		15 20	9 12	
228	26	IIu	eP iS eL M <sub>N</sub> M <sub>E</sub> F	5 09 03 18 18 27 35 30 52 35 35 6 56		19 18-19	70 140	
229	27	Iv	eP F	15 08 07 20				Iloilo (SE of Panay).

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

1, 0<sup>h</sup> 38<sup>m</sup> 41<sup>s\*</sup> [1, 8<sup>h</sup> 38<sup>m</sup> 41<sup>s</sup>]. Pandorocan (S de Mindoro). Temblor de tierra de intensidad III.

1, 2<sup>h</sup> 02<sup>m</sup> [1, 10<sup>h</sup> 02<sup>m</sup>]. N de Luzón. Temblor de tierra de intensidad III, sentida en la Provincia de Ilocos Norte, y parte N de la Montañosa y Cagayan. Su origen se hallaba en la Cordillera Central.

8, 2<sup>h</sup> 00<sup>m</sup> [8, 10<sup>h</sup> 00<sup>m</sup>]. Isla de Cuyo. Temblor oscilatorio, dirección N-S, intensidad III, duración 3<sup>s</sup>.

8, 21<sup>h</sup> 15<sup>m</sup> [9, 5<sup>h</sup> 15<sup>m</sup>]. Butuan (N de Mindanao). Temblor de tierra susultorio, intensidad II-III, duración 2<sup>s</sup>.

10, 22<sup>h</sup> 51<sup>m</sup> 20<sup>s\*</sup> [11, 6<sup>h</sup> 51<sup>m</sup> 20<sup>s</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección E-W, intensidad IV, duración 7<sup>s</sup>. Durante la noche precedente, según afirmaron algunas personas, se había sentido otro temblor muy ligero. Probablemente el origen de estos temblores estaba en el Pacífico, algo distante de Butuan, según parece desprenderse del carácter lento y horizontal de los movimientos, lo cual llamó la atención del observador y de otras personas: debió ser también perceptible en las costas de Surigao.

12, 2<sup>h</sup> 16<sup>m</sup> 16<sup>s\*</sup> [12, 10<sup>h</sup> 16<sup>m</sup> 16<sup>s</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección ENE-WSW, intensidad III-IV, duración 5<sup>s</sup>.

13, 7<sup>h</sup> 34<sup>m</sup> [13, 15<sup>h</sup> 34<sup>m</sup>]. SE. de Luzón. Temblor de tierra de intensidad III-IV, sentido en la parte oriental de la Provincia de Albay y en la de Sorsogon; su origen parece se hallaba al N del estrecho de San Bernardino.

17, 3<sup>h</sup> 02<sup>m</sup> 09<sup>s\*</sup> [17, 11<sup>h</sup> 02<sup>m</sup> 09<sup>s</sup>]. Batangas (S de Luzón). Temblor oscilatorio, dirección SE-NW, intensidad III, duración 8<sup>s</sup>.

17, 11<sup>h</sup> 13<sup>m</sup> [17, 19<sup>h</sup> 13<sup>m</sup>]. Butuan (N de Mindanao). Temblor de tierra de intensidad II-III. Repitió con la misma intensidad a 21<sup>h</sup> 25<sup>m</sup> (5<sup>h</sup> 25<sup>m</sup> del día 18).

19, 6<sup>h</sup> 20<sup>m</sup> [19, 14<sup>h</sup> 20<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección WNW-ESE, intensidad III, duración 3<sup>s</sup>.

22, 11<sup>h</sup> 26<sup>m</sup> 36<sup>s\*</sup> [22, 19<sup>h</sup> 26<sup>m</sup> 36<sup>s</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección E-W, intensidad III-IV, duración 35<sup>s</sup>, con dos series distintas de oscilaciones. Su origen parece se hallaba en el Pacífico.

25, 9<sup>h</sup> 10<sup>m</sup> [25, 17<sup>h</sup> 10<sup>m</sup>]. Surigao (NE de Mindanao). Temblor oscilatorio y susultorio, dirección ENE-WSW, intensidad IV, duración 6<sup>s</sup>.

25, 20<sup>h</sup> 20<sup>m</sup> [26, 4<sup>h</sup> 20<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio y susultorio dirección WNW-ESE, intensidad III, duración 4<sup>s</sup>.

27, 15<sup>h</sup> 08<sup>m</sup> 07<sup>s\*</sup> [27, 23<sup>h</sup> 08<sup>m</sup> 07<sup>s</sup>]. Iloilo (SE de Panay). Temblor de tierra de intensidad III. Su origen probable se hallaba en el interior de la isla al NW de Iloilo.

27, 18<sup>h</sup> 14<sup>m</sup> [28, 2<sup>h</sup> 14<sup>m</sup>]. Isla de Cuyo. Temblor oscilatorio, dirección E-W, intensidad III.

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche = 0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.

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## BULLETIN FOR JULY, 1913.



# METEOROLOGICAL BULLETIN FOR JULY, 1913.

By Rev. JOSÉ CORONAS, S. J.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

**Pressure and temperature.**—The mean atmospheric pressure of the month was less than that of July of last year in all the stations of the Philippines, the differences being over 1 mm. in almost the whole of Luzon. In Manila the difference from the normal of the month was  $-0.99$  mm., and from the mean of July, 1912,  $-0.91$  mm. The highest pressures were recorded on the 2d and 3d: the lowest on the 15th and 29th.

The mean monthly temperature differed but slightly from that of July, 1912, it being a trifle lower in Luzon and a trifle higher in the Visayas and Mindanao. The extreme values for Manila were  $34.8^{\circ}$  C. on the 1st and  $22.8^{\circ}$  C. on the 27th.

### PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR JULY, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from July, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from July, 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		$^{\circ}$ C.	$^{\circ}$ C.	$^{\circ}$ C.		$^{\circ}$ C.	
Tagbilaran	757.54	-0.24	759.19	2	754.75	15	27.1	+0.3	33.4	21	22.5	31
Surigao	57.18	-.41	58.87	3	53.74	15	27.7	+ .7	36	30	22.7	6
Cebu	57.25	-.24	59.28	2	53.64	15	27.6	+ .2	32.9	12	23.6	9
Iloilo	57.09	-.37	59.21	2	53.42	15	26.8	+ .2	32.3	3	22	2
Ormoc	57.37	-.48	59.38	2	53.37	15	<sup>a</sup> 26.6	-----	-----	-----	22?	27
Tacloban	56.83	-.74	59.24	2, 3	52.56	15	27.4	+ .2	34.4	20	22.7	9
Capiz	56.84	-.52	59.16	2	52.74	15	26.5	+ .1	34	20, 30	22.8	16, 17, 19
Calbayog	56.71	-.80	59.06	2	50.91	15	27.3	+ .3	33.7	7	22.7	2
Legaspi	56.11	-1.18	59.23	2	47.71	15	27.2	-.1	34.4	1, 13	22.2	9
Atimonan	55.84	-1.19	59.28	2	51.20	29	27	+ .4	33	9, 11	22.4	11
Ambulong, Tanuan	55.90	-----	58.98	2	51.11	29	26.6	-----	34	1	22.5	1
Paracale	55.90	-1.21	59.55	2	50.63	15	27.4	+ .3	33.6	2	22.9	21
Manila	56.26	-.91	59.36	2	50.80	29	26.5	-.1	34.8	1	22.8	27
San Isidro	56.14	-1.12	59.46	2	49.90	29	26.4	-.2	34.8	3	21.7	9
Dagupan	55.23	-1.23	58.71	3	47.94	29	27	-.2	37.3	4	22?	29, 30
Bolinao	55.26	-1.09	59	3	47.32	29	26.7	-.4	34.7	4	23	3
Baguio <sup>b</sup>	634.05	-1.04	637.59	3	625.69	29	18.1	-.5	26.4	6	15.4	24
Vigan	754.97	-1.43	759.12	3	741.90	29	27	-.5	33.4	4	22.4	30
Tuguegarao	54.96	-1.74	59.45	2	42.75	29	27.8	0	38.6	3	22.4	3, 29
Aparri	54.64	-1.69	59.24	3	41.40	29	28	+ .2	34.5	7	22.6	26, 30

<sup>a</sup> 17 days of observation only.

<sup>b</sup> The barometric readings of this station are not reduced to sea level.

**Rainfall.**—In the accompanying table of rainfall it will be seen that out of 50 stations, only 13 had a less total of rain than during July of last year, and that of the 26 stations for which a normal value can be given, only six had a less total than the normal of the month. The heaviest rainfalls in Luzon took place on the 14th–15th and 28th–29th, and were caused by two typhoons which were the most important of the month. In Manila the amount of rain collected in the gauges during the month was 570.6 mm., which is greater than the normal amount by 168.6 mm.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF JULY, 1913.

Station.	Total.	Departure from July, 1912.	Departure from normal.	Rainy days.	Departure from July, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from July, 1912.	Departure from normal.	Rainy days.	Departure from July, 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.						mm.	mm.	mm.			mm.	
Jolo	81.5		- 81.3	13		20.1	15	Calapan	371.7	+ 21.3		23	- 3	56.4	28
Isabela, Basilan	184	-130.7		13	- 7	57.7	4	Virac	373	- 23.2		18	- 6	171	15
Zamboanga	173	+ 31.5	+ 74.7	11	- 5	55.9	13	Nueva Caceres	401.9	+ 75	+132.9	18	- 8	1387	15
Davao	82.9	- 88.4	-131.5	11	- 1	18.3	3	Batangas	490.9	+ 69.8		23	+ 1	74.4	21
Cotabato	340.9	+ 19.3	+ 47.7	22	0	84.1	14	Atimonan	428.4	+ 51.5	+176.7	19	- 8	152.7	14
Cagayan, Misamis	175			15		41.1	22	Ambulong, Tanauan	417.4			23		83.6	28
Butuan	162.7	- 15.1	+ 33.1	15	- 3	64	13	Silang	695.9	+ 30.2		22	- 2	69.8	28
Dumaguete	154	- 95		15	- 2	33.8	5	Paracale	458.9	+ 49.5		19	- 6	122.4	15
Yap, W. Carolines	428.6	+ 10.8		24	- 4	102.6	24	Sta. Cruz, Laguna	387.8	+ 140		26	+ 3	88.4	28
Tagbilaran	208	-356.9	- 84.7	15	- 6	53.1	5	Manila	570.6	+ 41.6	+168.6	26	+ 1	83.7	20
Surigao	184.7	+ 40.1	+ 24.1	11	- 8	46.4	14	Antipolo	778.8	+ 184		28	+ 4	84.3	22
Maasin	417.5	+ 20	+135.4	10	- 5	127.1	14	Iba	1657.5	+ 766.6		29	+ 2	250.3	16
Cebu	142.2	- 82.7	- 37.7	18	- 1	30.2	9	San Isidro	324.7	- 15.4	- 30	24	- 1	57.8	29
Iloilo	518	+219.8	+ 61.9	22	- 2	142.9	23	Tarlac	294.7	+ 65.1	+ 59.2	25	+ 3	85.1	29
San Jose Buenavista	837.1	+326.7		29	0	175.3	23	Baler	149.5	- 337.1		18	- 5	26.2	14
Cuyo	623.4	+ 95.2		25	- 1	134.6	14	Dagupan	608.7	+ 59.7	+ 38.6	22	+ 1	176.4	29
Ormoc	596.4	+215.5	+271.5	21	- 1	318.6	14	Bolinao	1064.3	+ 335.4	+391.5	26	0	240	29
Guiuan	311.5	+130.5?		17	- 3	143	14	Baguio	1620.3	+1036.5	+617.1	30	+ 2	807.3	29
Tacloban	355.9	+132.8		17	- 6	244.3	14	San Fernando, Union	836.3	+ 311.5	+295.9	22	- 4	300.5	29
Capiz	345.3	- 56.6	- 34.3	17	-10	89.4	14	Echague	243.7	+ 105.6		14	- 2	54.1	28
Borongan	273.4	+ 96.8		19	- 2	64.2	14	Candon	1427.4	+ 778.5		20	- 2	779.3	29
Calbayog	235.6	+ 42.8	+ 15.5	19	- 6	128.9	14	Vigan	1333.2	+ 673.1	+680.4	23	- 1	478.9	28
Masbate	395.3	+196.5		15	- 6	116.6	15	Tuguegarao	529.3	+ 299.4	+281.2	18	0	263.6	28
Romblon	521.4	+ 62.3		23	- 5	66	14	Laoag	506.8	- 83		20	- 2	142.8	28
Batag	226.4			11		82.2	14	Aparri	218.4	+ 46.5	+ 31.7	12	+ 2	89.7	28
Gubat	350.2	+202.2		18	+ 2	115.8	14	Sto. Domingo, Bata-							
Legaspi	344.6	+ 88.7	+ 83.5	20	- 2	95.1	14	nes	206.6	- 10.8		21	+ 3	43.9	17
Sumay, Guam	178.9	+ 21.3		21	- 2	29.8	13								

## DEPRESSIONS AND TYPHOONS.

During the course of the month the Observatory announced three typhoons though none of them was of great importance, at least while crossing the Philippines. The first of these typhoons however was extremely interesting owing to the curious and abnormal character of its track.

The typhoon of July 12-23, 1913.—From the indications of this typhoon given in the observations from Yap and the Pelew, it is probable that it began on the 12th, not far from parallel 11° N and between meridians 133° and 135° E. In the Philippines the first indications of an atmospheric disturbance in the Pacific were noted on the afternoon of the 13th, and the following note was consequently sent to the papers:

There are indications that a typhoon is forming to the E of the central part of the Philippines.

As soon as the 6 a. m. observations of the 14th were received, it was possible to determine with more precision the position of the storm and to announce its direction, which was done with the following warning:

July 14, 9.15 a. m.: There is a depression or typhoon over the Pacific within 200 miles to the east of Samar, moving apparently westward.

By the evening of the 14th it was seen that the typhoon had curved somewhat to the north, and that therefore all danger for the Visayas had ceased. This was announced in the papers in these terms:

July 14, 9.45 p. m.: The typhoon seems to lie at present near 13° lat. N and between 126° and 127° long. E. It does not seem to be dangerous at present for the Visayas. It appears to be moving WNW toward Luzon and it may incline even more to the north.

The danger for Luzon mentioned in the previous warning persisted during the whole of the 15th, as may be seen from the warnings sent to the papers and shipping houses of Manila:



July 15, 7.30 a. m.: The typhoon was situated at 6 a. m. to-day in about  $125^{\circ}$  long. E and  $13^{\circ}$  lat. N, moving WNW or WbyN toward the southern part of Luzon.

July 15, 12.20 p. m.: The typhoon is at present in the neighborhood of Albay Province, moving WNW or WbyN, threatening to cross the southern part of Luzon.

July 15, 5.15 p. m.: The typhoon has passed across or very near to Catanduanes Island and Lagonoy Gulf. Its center is situated this afternoon over the easternmost part of Camarines Province, moving WNW or WbyN.

Happily for Manila and the southern and central provinces of Luzon the typhoon recurved to the north during the evening of the 15th, and consequently the danger spoken of in the earlier notes had ceased. The following are the warnings published at night-fall of the 15th and in the morning and afternoon of the 16th:

July 15, 9.30 p. m.: According to the last reports received from Nueva Caceres, it would seem that the typhoon is still in the neighborhood of Lagonoy Gulf or in the northeastern part of Camarines Province, moving very slowly and recurving northward and possibly even northeastward. Hence the danger for the other provinces of Luzon seems to have disappeared.

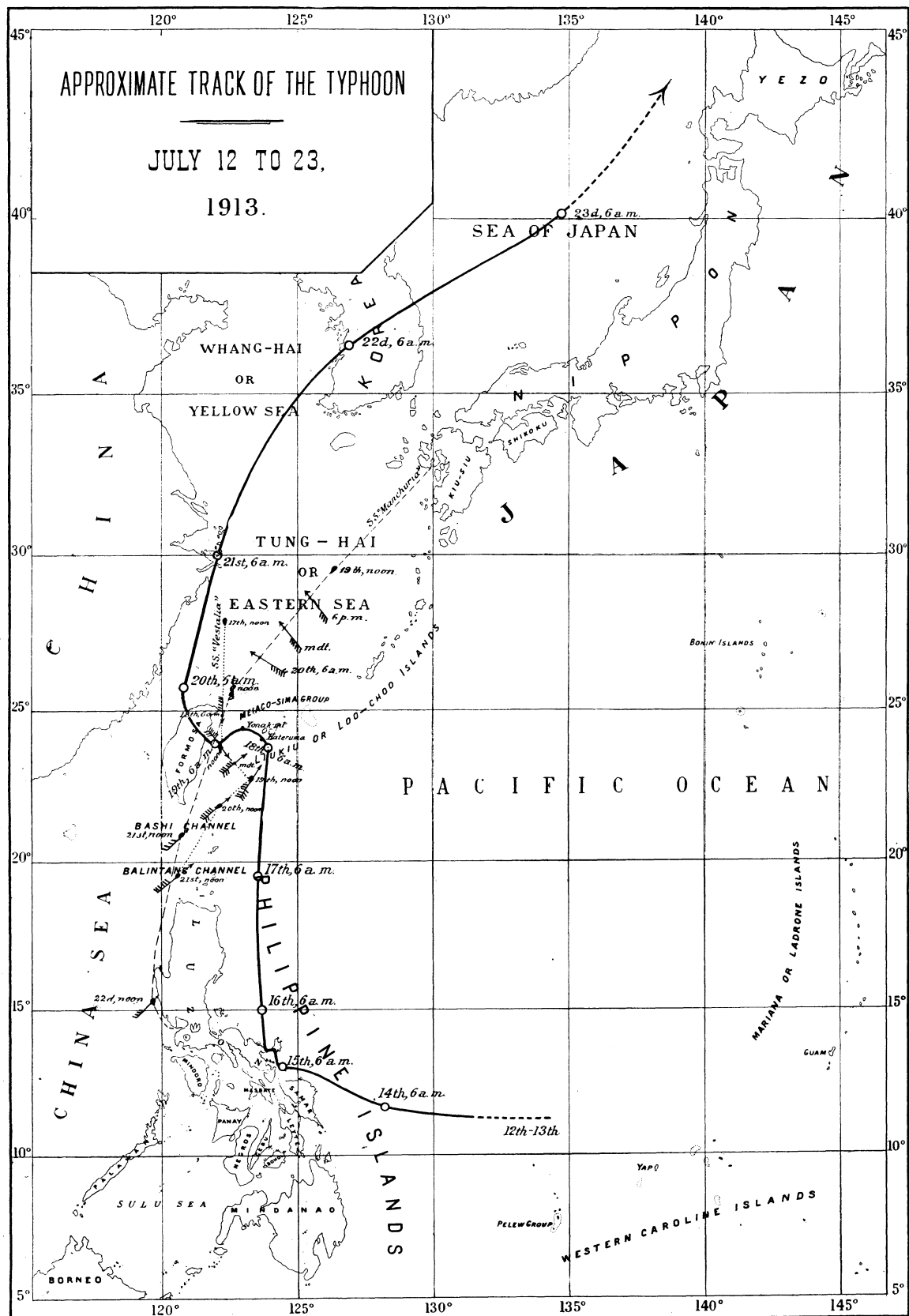
July 16, 9.30 a. m.: The typhoon has inclined northward since yesterday afternoon, its center being situated this morning in about  $15^{\circ}$  lat. N and between  $123^{\circ}$  and  $124^{\circ}$  long. E, moving apparently to the north.

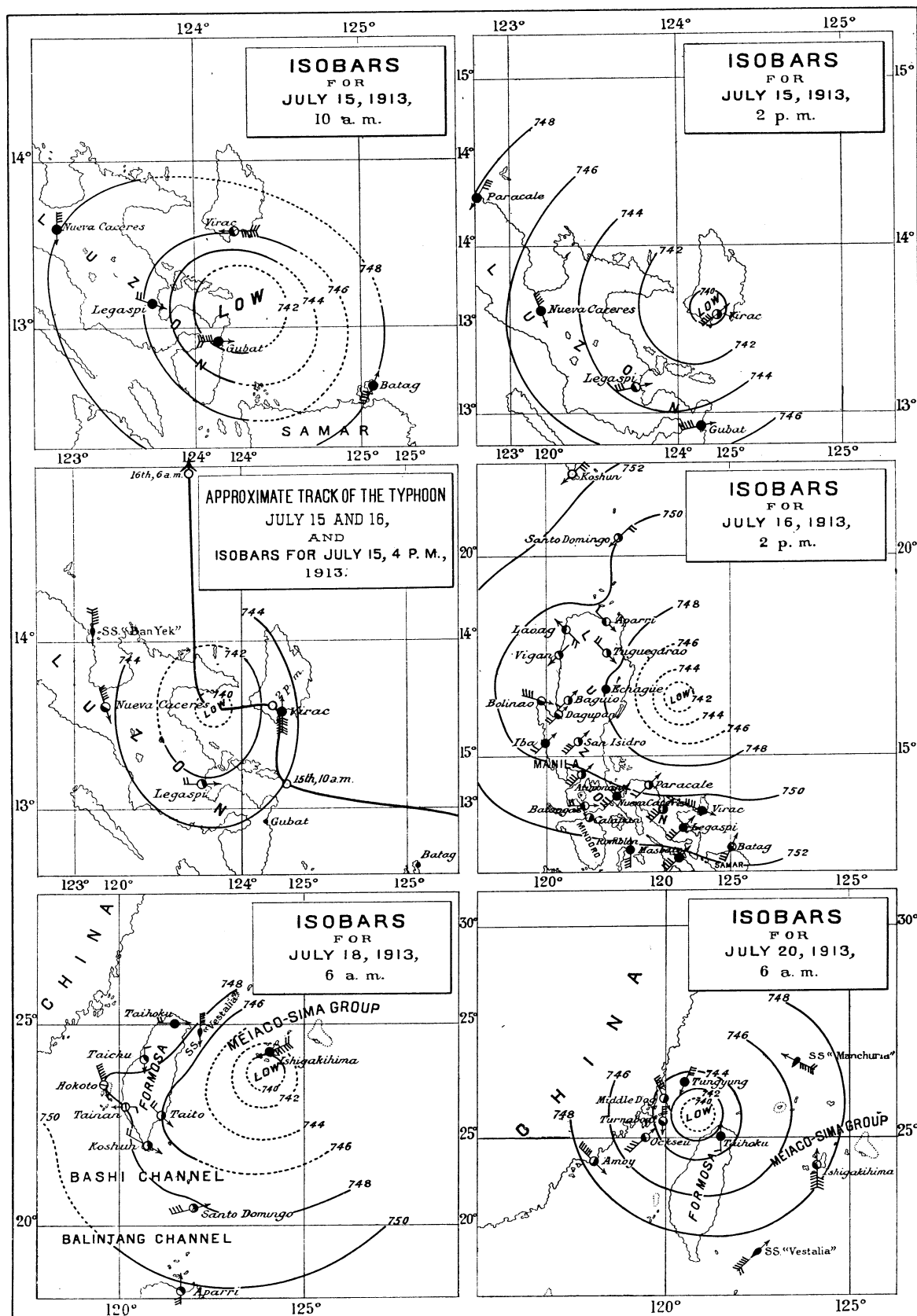
July 16, 4 p. m.: The typhoon is situated this afternoon between  $16^{\circ}$  and  $17^{\circ}$  lat. N and in about  $123^{\circ}$  long. E. It continues to move northward.

If these warnings be compared with the track as given in Plate VI it will be seen that they correspond except in a small part of the curve when the vortex of the typhoon was close to Catanduanes Island. A close study of the observations made in Virac, Gubat, Legaspi, and Nueva Caceres (see Plate VII) reveals an anomaly that can only be explained by taking for granted one of two things, viz, that while the typhoon was recurving to the north in the Gulf of Lagonoy, a small whirlwind or secondary center was formed on the right hand of the track which then crossed Catanduanes by the west and very close to Virac, or else, the typhoon in the short interval of seven or eight hours on the 15th changed its direction three times, first from W to N between 10 a. m. and 12 noon, then from N to W between 1 and 3 p. m., and finally again to the N between 4 and 6 p. m. On the supposition that a secondary whirl did not exist, the isobars were traced for every hour from 10 a. m. to 6 p. m. of the 15th and the resultant curve for this part of the track is as given in Plate VII with the three sharp changes of direction just mentioned. In the same plate three of these isobars, viz, those corresponding to 10 a. m., 2 p. m., and 4 p. m., are included. According to these isobars the vortex was in  $124^{\circ} 16'$  long. E and  $13^{\circ} 09'$  lat. N at 10 a. m.; in  $124^{\circ} 11'$  long. E and  $13^{\circ} 38'$  lat. N at 2 p. m.; and in  $123^{\circ} 50'$  long. E and  $13^{\circ} 36'$  lat. N at 4 p. m.

Although this second explanation is given as the more probable, there is no wish to deny the probability of the existence of a secondary center, because, if this were introduced into the isobars it would be possible to plot them in such a manner as to satisfy the supposition of a single recurve of the main storm to the north. Moreover, the supposition of the three sharp recurves adopted is not without its difficulties, for this requires the typhoon to have moved during these few hours with a velocity considerably greater than it had before and after the recurves, and this is the principal reason why the supposition of a secondary center is admitted as probable.

In the adjoined table of observations made in the stations of Batag, Gubat, Virac and Legaspi, it will be noticed that the lowest barometric minimum was that at Virac and that this was the only station where hurricane winds were observed before and after the actual minimum. These hurricane winds were interrupted by a large interval of light winds and relative calm. The calm, as described by the observer, was quite pronounced from 1.15 till 1.46 p. m. and during this half hour there were only light variable winds.





N.B.—The barometric readings have been reduced to standard gravity.

## METEOROLOGICAL OBSERVATIONS FOR JULY 15, 1913.

Date and hour.	Batag.				Gubat.				Virac.				Legaspi.			
	Pres- sure.	Wind.		Rain- fall every two hours.	Pres- sure.	Wind.		Rain- fall.	Pres- sure.	Wind.		Rain- fall.	Pres- sure.	Wind.		Rain- fall every four hours.
		Direc- tion.	Force.			Direc- tion.	Force.			Direc- tion.	Force.			Direc- tion.	Force.	
July 15:	mm.		0-12.	mm.	mm.		01-2.	mm.	mm.		0-12.	mm.	mm.		0-12.	mm.
1 a. m.					751.26	NW	2		751.07	ENE	2		751.52	Calm		
2 a. m.	745.20	WNW	5	a 3.8					51.01	N	1		50.17	WNW	1	15.5
3 a. m.	45.19	W	7						50	N	1		49.98	NNW	1	
4 a. m.	46.40	WSW	6	2.5	48.98	NW	3									
5 a. m.	47.87	WSW	5													
6 a. m.	48.81	WSW	4	2.5	47.38	W	4	b 63	48.53	NE	6	c 42.7		WNW	2	5.8
7 a. m.	49.04	SW	5		46.39	W	6						49.11	WNW	3	
8 a. m.	49.19	SSW	4	12.4	44.90	W	8		48	NE	6		48.21	WNW	3	
9 a. m.									48.11	ENE	8		48.10	WNW	4	
10 a. m.	49.79	SSW	5	8.9	43.52	W	8		48	E	9		47.90	WNW	2	1.3
11 a. m.					44	WSW	9		47	ESE	10		47.24	WNW	3	
Noon	50.05	SW	4	6.6	45.33	WSW	8		45.5	SE	12		46.65	WNW	3	
1 p. m.					46	WSW	6		40.8	SSE	6		46.07	WSW	3	
2 p. m.	49.99	SW	4	9.4	46.80	WSW	5	d 31.5	41	SW	5	e 20.1	45.82	WSW	3	2.3
3 p. m.									44	S	12		45.29	SW	4	
4 p. m.									45.2	S	12		44.37	W	2	
5 p. m.									43.9	SSW	12		44.02	SW	5	
6 p. m.									46	SSW	10		44.19	WSW	5	2.9
7 p. m.									47.5	SW	12		45.16	WSW	5	
8 p. m.									47.5	SSW	12		46.26			
9 p. m.									48	SW	11					
10 p. m.									49	SW	12		49.29	SW	5	17.8

<sup>a</sup> Rainfall from 7 p. m.  
<sup>b</sup> Rainfall from 8 p. m.  
<sup>c</sup> Rainfall from 4.40 p. m.

<sup>d</sup> Rainfall from 6 a. m.  
<sup>e</sup> Rainfall from 6 a. m.

The losses caused by the typhoon in Catanduanes do not appear to have been great. The observer at Virac forwarded this report:

The two wharves belonging to Smith, Bell & Co. and Gil Hermanos were totally destroyed, the loss of material being placed at ₱1,400.

According to information received from the president of the municipality of Virac the losses to the corn, hemp, coconut crops, and other products of country amount to about ₱2,000. Three houses of light materials were completely destroyed.

The further course of the typhoon after the afternoon of the 16th can be followed on the general track given in Plate VI. At 6 a. m. of the 17th, the vortex was to the east of Balintang Channel close to 20° lat. N. and between 123° and 124° long. E, moving toward the N. On the 18th, it crossed the Meiacosima group where it underwent another sharp recurve to the W, after which it recurved again to the N and NbyE when it reached the northern part of the Formosa Channel during the night of the 19th to the 20th. The storm then went to the NE. across the Yellow Sea and Korea on the 21st and 22d, and finally on the 23d it appeared in the northern part of the Sea of Japan, but in the from of a depression of small importance.<sup>1</sup>

<sup>1</sup> The first proofs of this bulletin had already been corrected when we received from Mr. H. Kondo, director of the Taihoku Observatory, Formosa, a series of observations and reports on the passage of this typhoon over Meiacosima and Formosa. The data arrived just in time to allow us to modify that part of the track of the typhoon given in Plate VI, which corresponds to the 18th and 19th.

According to this track which is based on hourly observations from eight stations, we hold that the typhoon recurved to the W on reaching Meiacosima, inclined to the SW before arriving at Formosa, which island it crossed in a direction to the NW, and finally turned again to the N and NbyE from the most northerly part of the Formosa Channel. Therefore the typhoon underwent between Meiacosima and the Formosa Channel changes of direction almost as sharp as those that took place near Catanduanes Island in the Philippines.

The director of the Taihoku Observatory agrees with us in supposing that there was only one cyclonic center on the 18th and 19th, not two as the "Journal of the Meteorological Society of Japan" of September and October, 1913, takes for granted. This is also the opinion of the director of the observatory of Zikawei (Revue Mensuelle, No. 7, Juillet, 1913) who, however, supposes that before the 18th—that is, on the 15th, 16th, and 17th—there existed besides the Philippine typhoon another

The Observatory continued to follow in a general way the latter part of the track of the storm in the weather notes of the 21st and 22d which read as follows:

July 21, 11.15 a. m.: The typhoon after entering the Continent yesterday morning near Foochow, inclined again to the N and even recurved northeastward. Its center was situated at 6 o'clock this morning to the S of Shanghai, moving apparently to NNE or NE.

July 22, 11.30 a. m.: The typhoon has continued moving NE toward Korea and the Sea of Japan.

The following telegrams were exchanged between Manila and Hongkong during the course of the typhoon.

MANILA.

July 14, 9.20 a. m.: Typhoon E of the Visayan Islands, moving W.  
 July 14, 9.40 p. m.: Typhoon E of the northern Visayas or southeastern Luzon, moving WNW.  
 July 15, 10 a. m.: Typhoon near or over southeastern Luzon, moving WNW.  
 July 15, 9.45 p. m.: Typhoon near or over southeastern Luzon, inclining northward.  
 July 16, 10 a. m.: Typhoon in about 123 long. E and 15 lat. N, moving N.  
 July 17, 9.40 a. m.: Typhoon E of Balintang Channel, moving N or NNE.  
 July 18, 9.50 a. m.: Typhoon over or near Meiacosima, moving N.  
 July 19, 8.50 a. m.: Typhoon near or over northern Formosa, moving W.  
 July 19, 6.30 p. m. Typhoon near or over the northern part of Formosa Channel, moving W or WNW.

HONGKONG.

July 14, 10.30 a. m.: Typhoon SE of Luzon, direction unknown.  
 July 14, 5.30 p. m.: Typhoon SE of Luzon, moving W.  
 July 15, 10.50 a. m.: Typhoon SE of Manila, moving WNW.  
 July 16, 10.50 a. m.: Typhoon NE of Manila, moving N.  
 July 17, 10.40 a. m.: Typhoon E of Balintang channel, moving N.  
 July 18, 10.40 a. m.: Typhoon E of Formosa, moving N.  
 July 19, 8.50 a. m.: Typhoon in N Formosa, moving W.  
 July 19, 3.30 p. m.: Typhoon in N Formosa, moving WNW.  
 July 20, 11 a. m.: Typhoon on mainland near Foochow, moving NNW.

to the S of the Liukiu Islands which joined the first one on the 18th. Although we do not deny that on the said days an area of low pressure appeared to the SE of the Liukius, nevertheless we do not believe that it acquired the development proper to a depression or typhoon.

The passage of the vortex was observed with all the phenomena generally associated with the vortex in two islands of the Meiacosima Group, as may be seen in the following reports kindly placed at our disposal by the director of the Taihoku Observatory:

"The following details of the typhoon are translated from the bulletin of the Central Meteorological Observatory, Tokyo:

"One report from an officer in Hateruma, a small island situated close to the south of Ishigakijima said that for a few days previously the NE wind had prevailed, its force increasing on the 17th. At 8 a. m. on the 18th strong winds came suddenly from the NW, and after 9 o'clock it became violent so that many houses were blown over and many trees uprooted. A little before 10 o'clock the wind suddenly calmed, the rain ceased, and the sun began to shine through broken clouds.

"After a calm of about twenty minutes duration it began to blow strongly from the SW and continued furious for nearly two hours after which it gradually decreased. Not a house was left unscathed and the greater number was destroyed.

"Another report from a school-teacher on Yonakuni Island, which is situated between Ishigaki and Formosa, states that the NE wind had prevailed for several days before the coming of the typhoon; on the 18th, it became stronger and accompanied with rain; from 2 p. m. the wind increased in force and the rain became very heavy; many houses were unroofed and branches were torn from the trees. At 5 p. m. the wind suddenly died away and there was a calm for nearly thirty minutes during which time the blue sky became visible, after which a destructive SE wind blew for six or seven hours. All the houses were badly damaged, four-fifths of them being completely destroyed.

"From these reports it is quite clear that the vortex passed over the island of Hateruma at 10 a. m., and over Yonakuni at 5 p. m. of the 18th.

"The coördinates of Hateruma and Yonakuni are approximately as follows. Hateruma, 24° 2' N 123° 45' E; Yonakuni, 24° 25' N 123° 00' E."

The typhoon of the 22-28 July, 1913.—As this typhoon had but little importance for the Philippines, we simply give the warnings sent out by the Observatory from the 22d to the 27th, and say a few words with regard to the track of the storm.

July 22, 3.45 p. m.: There are signs of a new depression or typhoon over the Pacific to the E of northern Luzon.

July 23, 11.50 a. m.: The typhoon mentioned yesterday afternoon is situated this morning in about 126° long. E and 19° lat. N, moving apparently WNW.

July 24, 11.55 a. m.: The depression or typhoon was situated at 6 o'clock this morning to the W of, and near to, the Balintang Channel moving apparently to W or WNW.

July 25, 11 a. m.: The typhoon was situated early this morning to the southeast of Hongkong in about 20° lat. N, moving W or WbyN.

July 26, 11.25 a. m.: The typhoon is situated this morning in the neighborhood of Hainan Strait and continues moving W or WbyN.

July 27, 11.30 a. m.: The typhoon of last week seems to have been recurving northward since yesterday afternoon in the northern part of the Gulf of Tongking to the northwest of Hainan.

The track of this typhoon, given in Plate VIII, was plotted with the help of the observations made in Santo Domingo, Batan Islands, in various stations on the coast N of Hainan and on the Gulf of Tongking, and on board the steamship *Taming* on her trip from Manila to Hongkong.

All of these observations came to hand long after the storm was finished and they confirm the warnings sent out by the Observatory. There remains only to add that during the first part of the track, viz, from the 22d to the 24th, there seems to have been but a depression which went on developing in the China Sea till it became a true typhoon on the 24th.

The typhoon of July 25-August 2, 1913.—After a careful examination of the observations made in Guam and Yap, there is scarcely the slightest doubt that this typhoon formed in the Pacific on the 25th to the W of Guam close to 140° long. E and between 13° and 14° lat. N. It then moved in the direction WbyN toward the northern part of the Island of Luzon.

This danger was announced by the Observatory on the morning of the 28th in these terms:

July 28, 8.50 a. m.: The typhoon is situated this morning in about 126° long. E and between 16° and 17° lat. N, moving WNW or WbyN. It may be dangerous for the northernmost part of Luzon.

At 7 p. m. of the same date this danger was confirmed much more explicitly:

July 28, 7. p. m.: The typhoon is approaching the northernmost part of Luzon. It will probably cross or pass very close to the Cagayan Province to-night or to-morrow morning.

The telegraph lines of the N of Luzon were interrupted in the evening of the 28th and remained out of action for several days. The two following notes were issued, however, by the Observatory in the morning of the 29th:

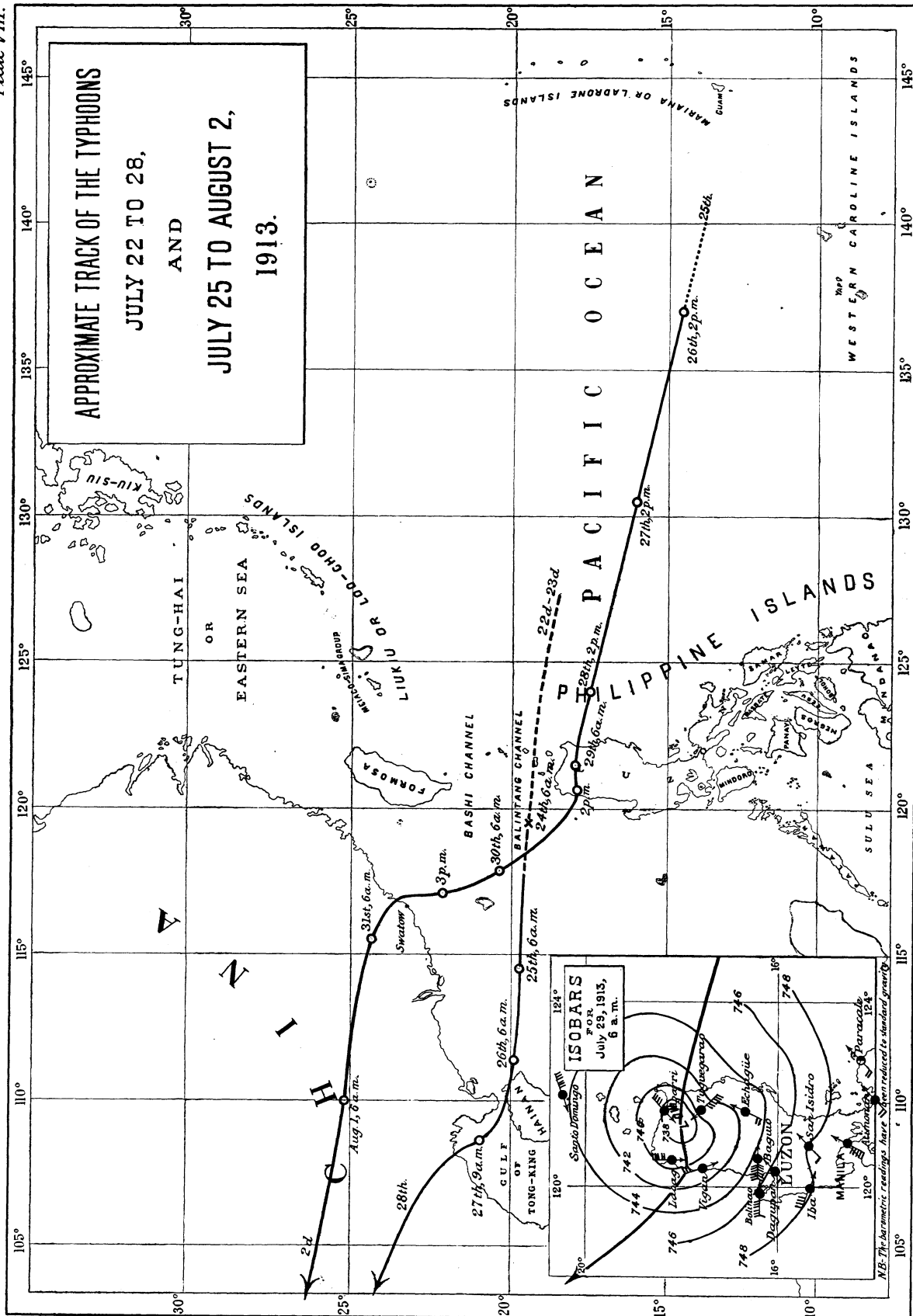
July 29, 8.45 a. m.: The typhoon is situated this morning over or very near the Province of Cagayan, in northern Luzon, moving apparently WbyN.

July 29, 11.50 a. m.: The effects of the storm are probably felt very severely in the Provinces of Cagayan and Ilocos Norte and in the Babuyan Islands.

The observations received a few days later confirmed these notes, with the exception that the typhoon inclined more to the W in crossing the Province of Cagayan and perhaps even to the WSW while it was passing over the southern part of the Province of Ilocos Norte.

In Plate VIII are given the isobars for 6 a. m. of the 29th, together with the general track of the storm, and in the table given below are copied the principal observations made in the stations of Tuguegarao, Aparri, Laoag, and Vigan. From them it will be seen that the vortex passed between Tuguegarao and Aparri and between Laoag and Vigan. One thing is to be noted, namely, that though a barometric minimum below

Plate VIII.



745 mm. was recorded, nevertheless the force of the winds was small. The rainfall, however, was very heavy in several stations of northern Luzon. Thus, in Bolinao, 240.0 mm. of rain fell in 24 hours, in Baguio 807.3 mm., in San Fernando de la Union 300.5 mm., in Vigan 478.9 mm., in Candon 779.3 mm., and in Tuguegarao 263.6 mm.

## METEOROLOGICAL OBSERVATIONS FOR JULY 28 TO 30, 1913.

Date and hour.	Tuguegarao.				Aparri.				Laoag.				Vigan.			
	Pres- sure.	Wind.		Rain- fall.	Pres- sure.	Wind.		Rain- fall every 4 hours.	Pres- sure.	Wind.		Rain- fall.	Pres- sure.	Wind.		Rain- fall.
		Direc- tion.	Force.			Direc- tion.	Force.			Direc- tion.	Force.			Direc- tion.	Force.	
July 28:	mm.		0-12	mm.	mm.		0-12	mm.	mm.		0-12	mm.	mm.		0-12	mm.
2 p. m. -----	750.81	Calm		<sup>a</sup> 4.6	750.76	NW	5	2	751.88	Calm		<sup>a</sup> 3.3	752.02	Calm		<sup>a</sup> 0.3
6 p. m. -----	48.77	S	1	16	48.55	NW	5	9.7	50.94	Calm		38.1	51.19	Calm		.5
10 p. m. -----	47.45	NW	3	61.8	46.57	N	7	50.8	48.47	NW		2	49.98	Calm		30.8
July 29:																
1 a. m. -----	44.24	NW	3	60.4	43.93	NNE	5		45.25	NW	5	48.3	46.51	NNW	2	203.2
2 a. m. -----	43.17	WNW	2	28.2	42.35	N	5	16.8	44.11	NW	6	.3	45.79	WNW	1	58.4
3 a. m. -----	42.75	W	3	18.3	41.50	N	5		43.18	NNW	5	4.3	44.20	NNW	2	50.8
4 a. m. -----	41.95	SW	4	16.5	40.52	N	5		42.48	NNW	6	1.5	43.90	Calm		61
5 a. m. -----	42.35	SW	5	24.6	40.24	N	4		42.18	NNE	5	.3	43.03	NNW	2	26.7
6 a. m. -----	42.07	SE	6	21.8	39.40	NE	4	2.3	40.87	N	5	5.1	42.73	NNW	3	31.7
7 a. m. -----	42.12	SE	6	20.6	39.85	SE	2		40.38	N	4	1.3	41.30	NNW	3	25.4
8 a. m. -----	42.06	SE	5	3.8	40.11	S	6		39.97	N	3		41.04	N	3	3.6
9 a. m. -----	42.22	SE	5	5.1	40.19	S	7		40.13	NNE	3		40.59	N	2	.3
10 a. m. -----	42.52	SSE	6	11.2	41.41	S	5	5.6	39.52	N	4		40.65	NbyE	2	.3
11 a. m. -----	42.59	SE	8						38.93	N	1	.1	40.25	NNW	2	2
Noon -----	42.60	SE	7						37.68	Calm		.1	39.65	NW	2	15.7
1 p. m. -----	42.52	SE	6						37.28	SEbyE	4		38.97	NWbyW	2	4.1
2 p. m. -----	41.85	SE	6	5.6	41.11	SE	6		37.23	ESE	2		38.67	W	2	13.2
3 p. m. -----	41.73	SE	6	3.8					36.99	Calm		3.8	38.37	W	2	13.2
4 p. m. -----	41.23	SE	4	2.3					36.56	Calm		8.9	38.53	WSW	2	4.8
5 p. m. -----	41.24	SE	8	11.9					37.05	Calm		4.6	39.28	SW	2	3
6 p. m. -----	41.92	SSE	7	2.5	40.29	SE	5	12.2	37.67	Calm		.3	39.83	SW	2	24.1
7 p. m. -----					41.54	S	6		38.16	SSW	3		40.34	SSW	3	7.6
8 p. m. -----	43.45	SE	5		41.36	S	5		39.04	SSW	5	.5	40.65	SSW	5	17.3
9 p. m. -----					42.21	S	6		39.71	SSW	4	1	41.86	SSW	5	25.4
10 p. m. -----	44.95	SE	8	1	43.86	S	5	22.9	40.63	SSW	6	1.5	43.70	SSW	6	8.9
July 30:																
2 a. m. -----	45.30	SE	2	8.1	44.01	SSE	5	6.4	42.83	SSW	8		46.48	SW	6	22.6
6 a. m. -----	47.34	SE	1		46.92	SSE	3	2.5	47.68	SSW	7	<sup>b</sup> 54.6	48.69	SSW	4	31.2
10 a. m. -----	49.74	S	2		49.48	S	3		49.58	SSW	5	5.4	50.32	SSE	4	33.8

<sup>a</sup> Rainfall from 10 a. m.<sup>b</sup> Rainfall from 10 p. m.

When the typhoon gained the China Sea, it inclined to the N till it entered the Continent close to Swatow during the night of the 30th. It then again moved to the W.

The following are the notes by which the Observatory followed up the further track of this typhoon:

July 30, 8.30 a. m.: The typhoon is situated at present over the China Sea to the W of the Balintang Channel, in about 118° long. E. and 20° lat. N, inclining northward.

July 31, 11.15 a. m.: The typhoon was moving yesterday to NNW and entered the Continent in the evening near Swatow. It seems that in the Continent it is inclining again westward.

August 1, 11.40 a. m.: The typhoon of the preceding days has been moving westward since yesterday across the southern part of China, its center being situated at 6 o'clock this morning in about 107° long. E and 25° lat. N.

The following are the warnings sent to the Observatories of Tokio, Zikawei, Taihoku, Hongkong and Phulien:

July 26, 4.45 p. m.: Typhoon N of Yap, direction unknown.

July 27, 9.25 a. m.: Typhoon NW of Yap, moving W or WNW.

July 27, 3.10 p. m.: Typhoon E of Luzon, more than 300 miles distant, moving WNW.

July 28, 9.15 a. m.: Typhoon E of Luzon, less than 300 miles distant, moving WNW.

July 28, 9.50 p. m.: Typhoon in about 123° long. E and 18° lat. N, moving WNW.

July 29, 6.50 a. m.: Typhoon crossing northern Luzon, moving W or WNW.

July 29, 8.35 a. m.: Typhoon near or over Aparri, moving W or WNW.

July 30, 8.05 a. m.: Typhoon in about 118° long. E and 20° lat. N, inclining northward.

July 30, 4.30 p. m.: Typhoon near or over the southern part of Formosa Channel, moving NNW or N.



The Observatory of Hongkong favored us with these telegrams:

July 28, 10.55 a. m.: Typhoon E of Luzon, moving WNW.

July 28, 11.45 p. m.: Typhoon in northern Luzon, moving WNW.

July 30, 9 a. m.: Typhoon west of Bashi Channel, moving N.

The Observatory of Zikawei followed the track of the typhoon from the 26th to the 31st by means of these warnings sent to the stations along the China coast:

July 26, 4.30 p. m.: Typhoon Yap, N to W within 240 miles, direction WNW.

July 27, 4 p. m.: Typhoon Yap, N to W beyond 240 miles, direction WNW.

July 28, 12 m. d.: Typhoon E of Luzon, direction WNW.

July 29, 7.20 a. m.: Typhoon NE of Luzon, direction WNW.

July 29, 12 m. d.: Typhoon E of Balintang Channel, direction WNW.

July 29, 2.45 p. m.: Typhoon Balintang Channel, direction WNW.

July 30, 11.15 a. m.: Typhoon SW of Formosa, direction NW.

July 30, 4.20 p. m.: Typhoon, center of Formosa Channel, recurving.

July 31, 10 a. m.: Typhoon Fukien Province, direction N.

## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes resulta para todas las estaciones menor que la de Julio del año pasado, siendo las diferencias mayores de 1 milímetro en casi toda la Isla de Luzón. La de Manila difiere de la normal de este mes en  $-0.99$  mm., y de la de Julio, 1912, en  $-0.91$  mm. Las presiones más altas se registraron el día 2 ó 3, y las más bajas, el 15 ó el 29.

La temperatura media mensual se diferencia muy poco de la del año pasado, siendo en general ligeramente menor en Luzón, y ligeramente mayor en Visayas y Mindanao. Los valores extremos para Manila fueron  $34.8^{\circ}$  C. y  $22.8^{\circ}$  C. observados respectivamente los días 1 y 27.

**Precipitación acuosa.**—En la tabla de lluvia que acompaña el texto inglés se verá que de 50 estaciones solamente 13 nos dan este mes un total de lluvia menor que en Julio del año pasado; y asimismo que de 26 estaciones, para las cuales podemos dar valores normales, sólo 6 aparecen con un total menor que el normal de este mes. Las lluvias más abundantes en Luzón ocurrieron los días 14–15 y 28–29, y fueron debidas a la influencia de dos tifones, los más importantes de este mes. En los pluviómetros de Manila se recogieron en todo el mes 570.6 mm., cantidad mayor que la normal de Julio en 168.6 mm.

## DEPRESIONES Y TIFONES.

Tres tifones anunció el Observatorio durante este mes, si bien ninguno de ellos fué de grande importancia al menos mientras atravesaban las Filipinas. El primero merece llamar de una manera especial nuestra atención por lo anormal y curioso de su trayectoria, según se verá por lo que diremos luego.

**Tifón de 12 á 23 de Julio, 1913.**—A juzgar por algunas ligeras indicaciones que dieron de este tifón las observaciones hechas en Yap y Palaos, parece se puede decir con bastante probabilidad que se formó el día 12 cerca del paralelo  $11^{\circ}$  N y entre los meridianos  $133^{\circ}$  y  $135^{\circ}$  E. En Filipinas se notaron los primeros indicios de perturbación atmosférica en el Pacífico la tarde del 13 en que se envió a los periódicos la siguiente nota:

Hay indicios de formarse una depresión al E de la parte central de Filipinas.

En cuanto se recibieron las observaciones de 6 a. m. del 14 se pudo ya determinar con más precisión la posición del baguio y anunciar su dirección por medio de este aviso de tifón:

Julio 14, 9.15 a. m.: Existe una depresión o tifón en el Pacífico a una distancia menor de 200 millas al E de Samar, moviéndose aparentemente al W.

La noche del mismo día 14 se vió que el tifón se había inclinado algo al norte, cesando por consiguiente el peligro para las Islas Visayas. Así se anunció en los periódicos de Manila en estos términos:

Julio 14, 9.45 p. m.: El tifón parece hallarse al presente cerca de  $13^{\circ}$  latitud y entre  $126^{\circ}$  y  $127^{\circ}$  longitud. No parece ser peligroso por ahora para las Islas Visayas. Probablemente se mueve al WNW hacia Luzón y podría ser que se inclinase aún más al norte.

El peligro anunciado para la Isla de Luzón persistió casi todo el día 15, como se verá por las siguientes notas y avisos dados al público y a las casas navieras de Manila:

Julio 15, 7.30 a. m.: El tifón se hallaba a las 6 a. m. de este día en los alrededores de  $125^{\circ}$  longitud y  $13^{\circ}$  latitud moviéndose al WNW o  $W\frac{1}{4}NW$  hacia la parte sur de Luzón.

Julio 15, 12.20 p. m.: El tifón se halla al presente en los alrededores de la Provincia de Albay moviéndose al WNW o  $W\frac{1}{4}NW$  amenazando cruzar la parte sur de Luzón.

Julio 15, 5.15 p. m.: El tifón ha pasado muy cerca o a través de la Isla Catanduanes y del Golfo de Lagonoy. Su centro se halla esta tarde sobre la parte más oriental de la Provincia de Camarines moviéndose al WNW o  $W\frac{1}{4}NW$ .

Afortunadamente para Manila y para las provincias de la parte meridional y central de Luzón pudo anunciar el Observatorio la noche del 15 que el tifón recurvaba al norte y que cesaba por lo tanto el peligro de que se hablaba en las notas anteriores. Véanse a continuación los avisos de tifón dados por el Observatorio la noche del 15 y mañana y tarde del 16:

Julio 15, 9.30 p. m.: Según las últimas observaciones recibidas de Nueva Cáceres, parece que el tifón se halla todavía en los alrededores del Golfo de Lagonoy o en la parte nordeste de la Provincia de Camarines, moviéndose muy despacio y recurvando al norte y aún tal vez al nordeste. De ahí que parece haber desaparecido el peligro para las otras provincias de Luzón.

Julio 16, 9.30 a. m.: El tifón se ha inclinado al norte desde ayer tarde, hallándose su centro esta mañana en los 15° latitud próximamente y entre 123° y 124° longitud, moviéndose aparentemente hacia el norte.

Julio 16, 4 p. m.: El tifón se halla esta tarde entre 16° y 17° latitud y en 123° longitud próximamente. Continúa moviéndose al norte.

Si comparan nuestros lectores las notas aquí mencionadas con la trayectoria de este tifón que damos en la Lámina VI, verán que hay casi completa uniformidad a excepción de una pequeña parte de la trayectoria cuando el vórtice se hallaba en los alrededores de la Isla Catanduanes. Un estudio detenido de las observaciones hechas en las estaciones de Virac, Gubat, Legaspi y Nueva Cáceres (véase la Lámina VII) dió por resultado una anomalía que únicamente podía explicarse suponiendo una de dos cosas, o bien que mientras el tifón recurvaba al N en el Golfo de Lagonoy, entre Catanduanes y Luzón, un remolino parcial formado al lado derecho de la trayectoria vino a atravesar Catanduanes por el W y muy cerca de Virac, o bien que el tifón en el intervalo de solas 7 u 8 horas cambió el día 15 tres veces de dirección casi en ángulo recto, primero al N entre 10 y 12 de la mañana, segundo de nuevo al W entre 1 y 3 p. m., y por último otra vez al N entre 4 y 6 p. m. En efecto, suponiendo que no existía ningún remolino secundario, hemos trazado las isobaras de hora en hora desde 10 a. m. hasta 6 p. m. del 15 y su resultado nos da esta parte de la trayectoria tal como la publicamos en la Lámina VII con los tres cambios bruscos de dirección que acabamos de indicar. En la misma lámina incluimos tres de las dichas isobaras, es decir las de 10 a. m., 2 y 4 p. m. Según ellas, el vórtice se hallaba en 124° 16' longitud E y 13° 09' latitud N a 10 a. m., en 124° 11' longitud E y 13° 38' latitud N a 2 p. m., y en 123° 50' longitud E y 13° 36' latitud N a 4 p. m.

Aunque damos esta segunda explicación como la más verosímil, no queremos negar por esto la probabilidad de que se hubiese originado un remolino secundario, toda vez que introducido éste en las isobaras sería posible trazarlas de manera que bastase suponer para el centro principal una sola recurva al norte, según se suponía en las notas dadas por el Observatorio antes de recibir las observaciones detalladas hechas de hora en hora en las estaciones arriba indicadas. Ni dejaremos de confesar tampoco que nuestra suposición carezca de alguna dificultad, pues desde luego llama la atención que a pesar de cambios tan bruscos de dirección resulta que hubo de moverse el baguio en aquellas horas con una velocidad bastante mayor que la que llevaba antes y después de las recurvas. Antes tal vez sea este el motivo principal que nos induce a admitir la probabilidad de un remolino secundario.

En el texto inglés ofrecemos a nuestros lectores reunidas en una tabla algunas de las observaciones hechas en las estaciones de Batag, Gubat, Virac y Legaspi. Desde luego se echa de ver que la mínima barométrica más baja es la de Virac con vientos huracanados antes y después de la mínima interrumpidos con un largo intervalo de vientos relativamente flojos y calma relativa. Esta calma, según escribe el observador, fué bastante pronunciada desde 1.15 hasta 1.46 p. m.; durante esta media hora no hubo más que ligeras ventolinillas. Las pérdidas causadas por este baguio en Catanduanes no parecen

haber sido de mucha consideración, según se desprende de la siguiente información facilitada por el observador de Virac.

Los dos pantalanos de las casas Smith, Bell & Co. y Gil Hermanos fueron destrozados completamente calculándose las pérdidas materiales de dichas casas en ₱1,400.

Según informes recibidos por el Sr. Presidente Municipal de este municipio de Virac, las pérdidas de los sembrados de maíz, abacales, cocotales, cañaverales y demás productos del país se calculan en ₱2,000. Además fueron destrozadas completamente tres casas de materiales ligeros.

El curso ulterior de este tifón desde la tarde del 16 lo verán nuestros lectores en la trayectoria general que publicamos en la Lámina VI. A 6 a. m. del 17 se hallaba el vórtice al E del Canal de Balintang cerca de 20° latitud y entre 123° y 124° longitud, moviéndose todavía al N. El 18 atravesó el grupo de Meiacosima donde otra vez verificó una aguda recurva al W, pero para volver a recurvar al N y N $\frac{1}{4}$ NE en cuanto llegó a la parte norte del canal de Formosa la noche del 19 al 20. Por último se dirigió al NE a través del Mar Amarillo y de Korea durante los días 21 y 22, y el 23 aparecía en la parte septentrional del Mar de Japón, aunque convertido ya en una depresión de poca importancia.<sup>1</sup>

<sup>1</sup> Habíamos corregido las primeras pruebas de este Boletín cuando recibimos de Mr. H. Kondo, Director del Observatorio de Taihoku en Formosa, observaciones y reports valiosísimos referentes al paso de este tifón por Meiacosima y Formosa. Estos datos nos llegaron a tiempo para modificar conforme a ellos en la lámina VI la parte de la trayectoria correspondiente a los días 18 y 19.

Según esta trayectoria que está basada en observaciones horarias de 8 estaciones de Formosa, tenemos que el baguio recurvó al W al llegar a Meiacosima, se inclinó al SW antes de llegar a Formosa, atravesó esta isla ya bastante deformado, en dirección al NW, y por último se dirigió otra vez al N y N $\frac{1}{4}$ NE desde la parte más septentrional del canal de Formosa. Verificó, pues, este baguio entre Meiacosima y el canal de Formosa cambios de dirección casi tan bruscos como los verificados en los alrededores de la Isla Catanduanes en Filipinas. El Director del Observatorio de Taihoku conviene con nosotros en que no había en los días 18 y 19 más que un centro ciclónico contra lo supuesto en el "Journal of the Meteorological Society of Japan," de Septiembre y Octubre, 1913. Lo mismo siente el Director del Observatorio de Zikawei (Revue Mensuelle, No. 7 Juillet, 1913), con la única diferencia, sin embargo, de que él supone que antes del 18, es decir, el 15, 16 y 17, existía además del de Filipinas, otro tifón al S de Liukiu el cual se fundió con el primero el día 18. Nosotros, aunque no negamos que en los días citados aparecía un área de baja presión hacia el SE de las Islas Liukiu, pero nunca hemos creído que llegase a adquirir el desarrollo propio de una depresión o tifón.

El paso del vórtice se observó con todos los fenómenos propios de él en dos islas del grupo de Meiacosima, según puede verse por los siguientes reports que tuvo la bondad de remitirnos el Director del Observatorio de Taihoku antes citado:

Los siguientes detalles del tifón de 18 de Julio, 1913, están traducidos del boletín del Observatorio Central Meteorológico de Tokyo.

Un report de un oficial de Hateruma, una pequeña isla situada muy cerca al SW de Ishigakijima, dió cuenta de que desde hacía algunos días dominaba el viento NE aumentando su fuerza el 17. A las 8 a. m. del 18 empezaron a soplar de repente vientos fuertes del NW: después de 9 a. m. llegaron a ser violentos, siendo derribadas muchas casas y arrancados de cuajo muchos árboles. Un poco antes de las 10 a. m. el viento de repente disminuyó en fuerza y calmó completamente, la lluvia cesó, y el sol brilló por entre las nubes.

Después de la calma que duró unos 20 minutos soplaron vientos más violentos del SW continuando furiosamente por cerca de dos horas. No hay ninguna casa en la isla que no haya sufrido, quedando destruídas la mayoría.

Otro report de un maestro de escuela de la Isla de Yonakuni, situada entre Ishigaki y Formosa, dice que el viento del NE había dominado por algunos días antes de llegar el tifón; el 18 soplaba del N con más fuerza y con lluvia; y desde 2 p. m. era el viento huracanado, destechándose muchas casas y cayéndose las ramas de los árboles. Hacia las 5 p. m. el viento calmó repentinamente por cerca de 30 minutos, durante los cuales se podía ver el azul del cielo y la lluvia era muy ligera. De nuevo empezó el viento destructor del SE continuando furiosamente por seis o siete horas. Todas las casas han sufrido mucho, quedando destruídas las cuatro quintas partes.

Por estos reports queda evidentemente probado que el vórtice cruzó la Isla de Hateruma a las 10 a. m. y la de Yonakuni a las 5 p. m. del 18.

Las coordenadas de Hateruma y Yonakuni son aproximadamente las siguientes:

Hateruma 24° 2' N 123° 45' E Yonakuni 24° 25' N 123° 00' E.

El Observatorio de Manila fué siguiendo de una manera bastante aproximada esta última parte de la trayectoria de este tifón en las notas del tiempo de los días 21 y 22 donde se decía lo siguiente:

Día 21, 11.15 a. m.: El tifón, después de penetrar en el Continente ayer mañana cerca de Foochow, se inclinó otra vez al N y aún recurvó al NE. Su centro se hallaba a las 6 de esta mañana al S de Shanghai moviéndose aparentemente al NNE o NE.

Día 22, 11.30 a. m.: El tifón ha seguido moviéndose al NE hacia Korea y el Mar de Japón.

Los siguientes telegramas se cruzaron durante este tifón entre los Observatorios de Manila y Hongkong:

#### MANILA.

Julio 14, 9.20 a. m.: Tifón al E de las Islas Visayas, moviéndose al W.

Julio 14, 9.40 p. m.: Tifón al E de las Visayas septentrionales o de la parte sudeste de Luzón; moviéndose al WNW.

Julio 15, 10 a. m.: Tifón en, o cerca de, la parte sudeste de Luzón; moviéndose al WNW.

Julio 15, 9.45 p. m.: Tifón en, o cerca de, la parte sudeste de Luzón; inclinándose al norte.

Julio 16, 10 a. m.: Tifón en los alrededores de 123° longitud E y 15° latitud N., moviéndose al norte.

Julio 17, 9.40 a. m.: Tifón al este del Canal de Balintang; moviéndose al N o NNE.

Julio 18, 9.50 a. m.: Tifón en, o cerca de, Meiacosima, moviéndose al norte.

Julio 19, 8.50 a. m.: Tifón en, o cerca de, la parte N de Formosa, moviéndose al W.

Julio 19, 6.30 p. m.: Tifón en, o cerca de, la parte N del Canal de Formosa, moviéndose al W o WNW.

#### HONGKONG.

Julio 14, 10.30 a. m.: Tifón al SE de Luzón, dirección desconocida.

Julio 14, 5.30 p. m.: Tifón al SE de Luzón, moviéndose al W.

Julio 15, 10.50 a. m.: Tifón al SE de Manila, moviéndose al WNW.

Julio 16, 10.50 a. m.: Tifón al NE de Manila, moviéndose al N.

Julio 17, 10.40 a. m.: Tifón al E del Canal de Balintang; moviéndose al N.

Julio 18, 10.40 a. m.: Tifón al E de Formosa, moviéndose al N.

Julio 19, 8.50 a. m.: Tifón en el N de Formosa; moviéndose al W.

Julio 19, 3.30 p. m.: Tifón en el N de Formosa; moviéndose al WNW.

Julio 20, 11 a. m.: Tifón en el Continente cerca de Foochow; moviéndose al NNW.

Tifón de 22 á 28 de Julio, 1913.—Fué este tifón de muy poca importancia para Filipinas, y así nos contentaremos con copiar aquí las notas que sobre él dió el Observatorio desde el 22 hasta el 27, y decir luego dos palabras sobre la trayectoria que de hecho siguió conforme a las observaciones que recibimos posteriormente. Las notas del Observatorio son como siguen:

Julio 22, 3.45 p. m.: Hay indicios de una nueva depresión o tifón en el Pacífico al E del norte de Luzón.

Julio 23, 11.50 a. m.: El tifón mencionado ayer tarde se halla esta mañana en los alrededores de 126° longitud E y 19° latitud N, moviéndose aparentemente al WNW.

Julio 24, 11.55 a. m.: La depresión o tifón se hallaba a las 6 de hoy al W y cerca del Canal de Balintang, moviéndose aparentemente al W o WNW.

Julio 25, 11 a. m.: El tifón se hallaba esta madrugada al SE de Hongkong en los alrededores de 20° latitud N, moviéndose al W o W½NW.

Julio 26, 11.25 a. m.: El tifón se halla esta mañana en los alrededores del estrecho de Hainán y continúa moviéndose al W o W½NW.

Julio 27, 11.30 a. m.: El tifón de la semana pasada parece haber recurvado al norte desde ayer tarde en la parte septentrional del Golfo de Tongking al NW de Hainán.

La trayectoria de este tifón que damos en la Lámina VIII está trazada teniendo a la vista observaciones hechas en Santo Domingo, Islas Batanes, en varias estaciones de la costa norte de Hainán y del Golfo de Tongking, y a bordo del vapor *Taming* en viaje de Manila a Hongkong. Todas estas observaciones que se recibieron mucho tiempo después vinieron a confirmar los avisos y notas del Observatorio que acabamos de copiar.

Solamente hemos de hacer constar que en la primera parte de la trayectoria, es decir del 22 al 24, no parece existiese más que una depresión la cual se fué desarrollando en el Mar de China hasta convertirse en verdadero tifón el día 24.

**Tifón de 25 de Julio a 2 de Agosto, 1913.**—Después de haber examinado con todo cuidado las observaciones hechas en Guam y Yap, apenas nos puede caber la menor duda de que se formó este tifón el día 25 al W de Guam en los alrededores de  $140^{\circ}$  longitud E y entre  $13^{\circ}$  y  $14^{\circ}$  latitud N. Desde luego se dirigió al  $W\frac{1}{4}NW$  en dirección a la parte norte de la Isla de Luzón. Este peligro lo anunció el Observatorio la mañana del 28 en estos términos:

Julio 28, 8.50 a. m.: El tifón se halla esta mañana en los alrededores de  $126^{\circ}$  longitud E y entre  $16^{\circ}$  y  $17^{\circ}$  latitud N, moviéndose al WNW o  $W\frac{1}{4}NW$ . Podría ser peligroso para la parte más septentrional de Luzón.

A las 7 p. m. del mismo día 28 se confirmó este peligro pero de una manera mucho más explícita y terminante:

Julio 28, 7 p. m.: El tifón se está acercando a la parte más septentrional de Luzón. Probablemente pasará a través o muy cerca de la Provincia de Cagayán esta noche o mañana por la mañana.

Desde la noche del 28 al 29 quedaron interrumpidas las líneas telegráficas del norte de Luzón, durando después esta interrupción por espacio de varios días. El Observatorio dió al público estas dos notas la mañana del 29:

Julio 29, 8.45 a. m.: El tifón se halla esta mañana en, o muy cerca de, la Provincia de Cagayán, en el norte de Luzón, moviéndose aparentemente al  $W\frac{1}{4}NW$ .

Julio 29, 11.50 a. m.: Los efectos del temporal son sentidos probablemente con mucha intensidad en las Provincias de Cagayán e Ilocos Norte y en las Islas Babuyan.

Las observaciones que recibimos varios días más tarde vinieron a confirmar estas notas del Observatorio con la única excepción de que el baguio se inclinó más al W al cruzar la Provincia de Cagayán, y aún tal vez algo al WSW mientras atravesaba la parte meridional de la Provincia de Ilocos Norte.

En la Lámina VIII verán nuestros lectores, juntamente con la trayectoria general de este tifón, las isobaras de 6 a. m. del día 29. Además ofrecemos en el texto inglés reunidas en una tabla las principales observaciones hechas en las estaciones de Tuguegarao, Aparri, Laoag y Vigan. Por ellas se verá cómo el vórtice pasó por entre las dos primeras estaciones y también por entre las dos últimas. Lo que más llama la atención en estas observaciones es que a pesar de haberse registrado una mínima barométrica bastante menor de 745. mm., sin embargo, fué muy poca la fuerza de los vientos. En cambio las lluvias fueron muy abundantes en varias estaciones de la parte norte de Luzón dando lugar en algunos puntos a las consiguientes inundaciones. Así, en el intervalo de 24 horas se recogieron 240.0 mm. de agua en Bolinao, 807.3 mm. en Baguio, 300.5 mm. en San Fernando, Unión, 478.9 mm. en Vigan, 779.3 mm. en Candón y 263.6 mm. en Tuguegarao.

Una vez en el Mar de China el tifón se inclinó al norte hasta que penetró en el Continente por las cercanías de Swatow la noche del 30 al 31. En el Continente se movió de nuevo hacia el W. Con las siguientes notas fué siguiendo el Observatorio de Manila esta última parte de la trayectoria de este baguio.

Julio 30, 8.30 a. m.: El tifón se halla al presente en el Mar de China al W del Canal de Balintang en los alrededores de  $118^{\circ}$  longitud E y  $20^{\circ}$  latitud N, inclinándose al N.

Julio 31, 11.15 a. m.: El tifón se movió ayer al NNW y entró en el Continente la noche pasada cerca de Swatow. Parece que una vez en el Continente se inclina de nuevo al W.

Agosto 1, 11.40 a. m.: El tifón de los días anteriores se ha estado moviendo al W desde ayer a través de la parte meridional de China, hallándose su centro a las 6 de esta mañana en los alrededores de  $107^{\circ}$  longitud E y  $25^{\circ}$  latitud N.

El Observatorio de Manila envió los siguientes avisos de tifón a los Observatorios de Tokio, Zikawei, Taihoku, Hongkong y Phulien:

- Julio 26, 4.45 p. m.: Tifón al N de Yap, dirección desconocida.
- Julio 27, 9.25 a. m.: Tifón al NW de Yap, moviéndose al W o WNW.
- Julio 27, 3.10 p. m.: Tifón al E de Luzón, distancia mayor de 300 millas, moviéndose al WNW.
- Julio 28, 9.15 a. m.: Tifón al E de Luzón, distancia menor de 300 millas; moviéndose al WNW.
- Julio 28, 9.50 p. m.: Tifón en los alrededores de 123° longitud E y 18° latitud N, moviéndose al WNW.
- Julio 29, 6.50 a. m.: Tifón cruzando la parte norte de Luzón, moviéndose al W o WNW.
- Julio 29, 8.35 a. m.: Tifón en, o cerca de, Aparri; moviéndose al W o WNW.
- Julio 30, 8.05 a. m.: Tifón en los alrededores de 118° longitud E y 20° latitud N; inclinándose al norte.
- Julio 30, 4.30 p. m.: Tifón en, o cerca de, la parte sur del Canal de Formosa; moviéndose al NNW o N.

El Observatorio de Hongkong nos favoreció a la vez con estos telegramas:

- Julio 28, 10.55 a. m.: Tifón al E de Luzón; moviéndose al WNW.
- Julio 28, 11.45 p. m.: Tifón en el N de Luzón; moviéndose al WNW.
- Julio 30, 9 a. m.: Tifón al W del Canal de Bashi; moviéndose al N.

El Observatorio de Zikawei fué siguiendo también la trayectoria de este tifón desde el 26 al 31 por medio de estos avisos de tifón transmitidos a las estaciones de la costa de China:

- Julio 26, 4.30 p. m.: Tifón hacia el NW de Yap, distancia menor de 240 millas, dirección WNW.
- Julio 27, 4 p. m.: Tifón hacia el NW de Yap, distancia mayor de 240 millas, dirección WNW.
- Julio 28, 12 m. d.: Tifón al E de Luzón, dirección WNW.
- Julio 29, 7.20 a. m.: Tifón al NE de Luzón, dirección WNW.
- Julio 29, 12 m. d.: Tifón al E del Canal de Balintang, dirección WNW.
- Julio 29, 2.45 p. m.: Tifón en el Canal de Balintang, dirección WNW.
- Julio 30, 11.15 a. m.: Tifón al SW de Formosa, dirección NW.
- Julio 30, 4.20 p. m.: Tifón en el Canal de Formosa, recurvando.
- Julio 31, 10 a. m.: Tifón en Fukien, dirección N.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied,  $-1.72$  mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Rela- tive humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.			Free expo- sure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.				
1	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.
1	758.50	28.2	34.8	23.7	30.7	32.2	31.3	31.5	30.5	29.5	76.7	21.5	3.8	3
2	59.36	27.3	33.5	24	30.3	31.7	31.1	31.6	30.2	29.3	83.2	22.1	3.5	2.2
3	59.27	27.5	33.8	23.7	30.6	32.2	31.6	31.7	30.4	29.4	82.8	22.3	3.8	2.9
4	58.70	27.2	32	23.8	30.7	32.1	31.6	31.8	30.4	29.4	84.9	22.8	2.7	2.1
5	57.89	27.3	33.4	23.4	30.9	32	31.6	31.6	30.4	29.4	79.7	21.3	2.5	2.3
6	58.02	27	33.2	23.3	29.8	31.3	31.5	31.5	30.4	29.4	81.3	21.4	5.4	4.6
7	57.94	27.6	34.1	23.5	30.1	31.4	31.3	31.3	30.5	29.3	80.1	21.8	3.7	2.6
8	57.94	28.2	32.7	23.8	30.4	31.7	31.3	31.5	30.6	29.4	80	22.4	4.6	3.1
9	57.60	27.6	32.8	23.7	30.7	31.7	31.5	31.5	30.5	29.5	81.6	22.3	3.8	2.8
10	57.47	27.2	31.1	23.9	30.6	31.5	31.6	31.5	30.5	29.5	82.9	22	3.6	2.6
11	57.43	27.2	32	23.8	30.4	31.5	31.3	31.4	30.6	29.5	81.4	21.8	3.3	2.7
12	58.49	26.5	31.4	23.7	30.1	30.5	31.2	31	30.5	29.5	86.2	22.1	1.1	1.3
13	58.13	26.3	32.5	24	29.9	30.6	31	30.9	30.6	29.5	88.9	22.4	1.6	1.6
14	55.74	26.5	31.5	23.5	29.5	30.4	30.8	31	30.5	29.4	87	22.2	2.7	1.7
15	52.93	25.7	27.8	24.1	29.7	29.5	30.9	30.7	30.5	29.4	92.3	22.6	.1	.6
16	52.55	26.1	28.6	24.4	28.8	29.1	30.2	30.1	30.5	29.5	88.8	22.3	1.6	1.9
17	54.40	25.5	29.2	24	28.3	28.4	29.8	29.7	30.5	29.4	90	21.8	.2	1
18	55.13	26.1	30.5	24.2	27.8	28.6	29.1	29.5	30.5	29.5	91.1	22.8	.9	1.4
19	55.17	26.9	31.2	24.4	28	28.7	29.1	29.1	30.5	29.4	87.7	23	2.3	2.1
20	56.77	25.1	27.9	23.6	28.2	27.7	29.1	29	30.3	29.4	93.3	22.1	.8	.2
21	56.80	24.9	28.1	22.9	26.6	27.1	28.1	28.3	30.3	29.4	92.3	21.6	.4	1.2
22	55.30	25.7	30.1	23.6	27	27.5	28.2	28.1	30.3	29.5	91.4	22.3	.9	1.6
23	53.64	25.9	30.3	24	27.3	27.4	28.2	28.4	30.2	29.4	89.3	22.2	1	1.6
24	53.91	25.6	28.9	24.1	27.5	27.8	28.2	28.4	29.9	29.4	89.4	21.8	1.3	1.4
25	55.68	26.3	31.2	23.7	27.6	28.5	28.3	28.8	29.8	29.4	86.5	21.9	2.5	2.1
26	57.41	26.6	31.7	23.6	27.8	28.7	28.6	28.7	29.9	29.4	84.7	21.8	3	2.1
27	56.90	25.7	30.5	22.8	28.4	28.7	28.8	28.8	29.9	29.5	88.2	21.6	3.9	3.8
28	53.74	25.3	27	23.7	27.6	28	28.8	28.8	29.7	29.3	91	21.8	.3	1.4
29	50.80	25.6	27.7	23.5	27.1	27	28.4	28.3	29.6	29.4	90.1	21.9	.5	2.1
30	54.13	26.2	28.7	24.2	26.7	26.8	27.8	28	29.5	29.2	88.5	22.3	1.4	1.3
31	56.36	25.7	28.6	24	26.8	27.2	27.5	27.8	29.6	29.2	92.8	22.8	.4	.7
Mean	756.26	26.5	30.9	23.8	28.9	29.6	29.9	30	30.3	29.4	86.6	22.1	2.2	2
Total													67.6	62
Departure from normal	-0.99	-0.5	0	+0.1							+1.8	-0.3		

Day.	Prevailing direction.	Wind.			Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.
		Total move- ment.	Maxi- mum hourly veloc- ity.	Direction at the time of the maximum velocity.		Form and its direction.				
						Upper.	Lower.			
1	Variable	Km. 146.5	Km. 12	W, NE	0-10.	Ci.	Cu.	E	h. m. mm. d a. f d° p.	
2	N quad.	92	7	ESE, NNE	8.5	Ci.-S.	Cu.	ESE	4 15 0° f d° p.	
3	N quad.	175	20	WNW	6	Ci.	Cu.	ESE	6 35 f d° p.	
4	N, SE	126	10.5	N	7.8	Ci.-S.	Cu.	E	2 40 p° p.	
5	NE, WNW	113	11	ws, wnw	8.3	Ci.	Cu.	E	6 35 7.1 p° p.	
6	E quad.	128	13	WNW	7.6	Ci.-S.	Cu.	SE	6 05 9.2 p° p.	
7	SSE	151	17.5	SSE	6.8	Ci.	Cu.	E	5 00 a. p.	
8	WSW	267	32	WSW	5.2	Ci.	Cu.	E	8 30 a. p.	
9	WSW	321	33	WSW	5.8	Ci.	Cu.	SW	6 25 11.8 a. p.	
10	WSW	334	39	WSW	7.6	A.-Cu.	Cu.	SW	5 50 1.5 a. p.	
11	SW	303	30	WSW	7.8	Ci.	Cu.	E	5 05 d° p.	
12	WSW	170	20	WSW	9.9	Ci.-S.	N.-cf.	W	1 00 34.5 a. p.	
13	NE, W	115	14	W	7.2	Ci.	Cu.	NE	4 35 2.1 p° p.	
14	N quad.	171	15	WNW	9.7	Ci.-S.	Cu.	NbyE	4 20 2.5 a. p. d° p.	
15	N, NNW	167.5	17	N	10	Ci.-S.	N.	NNW	0 00 31.2 a. p.	
16	SW	522.5	50	SW	10	Ci.-S.	Cu.-N.	WSW	0 00 7.4 a. p.	
17	SSW	379	27	SSW	10		N.	WSW	0 00 43.2 a. p.	
18	SW	442	31	W	10	Ci.-S.	Cu.-N.	WSW	0 50 55.4 a. p.	
19	SW	576	44	WbyS	9.7	Ci.-S.	Cu.-N.	W	1 35 22.3 a. p.	
20	WSW	473.5	38	W	10		N.	WSW	0 00 83.7 a. p.	
21	WSW	477.5	40	WSW	10	Ci.-S.	Cu.-N.	WSW	0 00 75.8 a. p.	
22	WSW	468	45	WSW	10	A.-Cu., Ci.-S.	Cu.-N.	WSW	1 15 28.5 a. p.	
23	WSW	564.5	37	SWbyW	10	Ci.-S.	Cu.-N.	W	0 35 14.1 a. p.	
24	SSW	348.5	26	SWbyS	10	Ci.-S.	Cu.-N.	WSW	0 00 2.4 a. p.	
25	SSW	352.5	24	SSW	8.7	Ci.-S.	Cu.-N.	SW	0 45 1.5 a. p.	
26	WSW	309	33	WbyS	8.8	A.-Cu. WNW	Cu.	WSW	3 20 .8 d a.	
27	WNW	218	24	WNW	9.2	Ci.-S.	Cu.-N.	W	2 00 13.8 d a. p.	
28	WSW	476	43	SWbyW	10		Cu.-N.	WNW	0 00 5 a. p.	
29	SW	1,048	69	SW	10		Cu.-N.	WSW	0 00 53.9 a. p.	
30	SW quad.	675.5	48	SW	10	Ci.-S.	N., Cu.-N.	ws	0 00 29 a. p.	
31	SW	263.5	30	SW	9.9	Ci.-S.	Cu.-N.	SW	0 00 32 a. p.	
Mean		334.6	29		8.7				2 46	
Total		10,374							85 40 570.6	
Departure from normal		+1,862.7			+0.9				-61 06 +168.6	

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.



METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.<sup>a</sup>

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.	Upper.	Lower.	
1.	758.51	26.7	32.5	23.2	92.3	24	S	0.5	4.2	Ci.	Cu. SSW, SW	mm.
2.	59.19	26.4	31.7	22.8	86.3	22	SE quad.	.8	4.2	Ci.	Cu. SSW	1.5
3.	59.09	25.7	32.7	22.8	93	22.7	SE	.7	6.2	Ci.-S.	Cu. E	2.8
4.	58.11	26.2	32.9	23.5	93.2	23.4	SE quad.	.7	6	Ci.-S.	Fr.-Cu. E	53.1
5.	57.64	26.2	30.3	23	92.7	23.5	SE, NE	.7	6.5	Ci.-S.	Cu.	
6.	58.27	26.7	30.9	23.7	88.5	23	S, SE	.7	7.5	Ci.-S.	Cu.	
7.	58.46	27.6	32.5	23.2	87.7	23.9	S	1.3	3.3	Ci.	Fr.-Cu. SSW	
8.	58.17	28.1	33.1	24.6	88.2	24.9	S	1.2	5.3	Ci.	Cu. SSE	2.6
9.	58.04	26.9	31.6	23.3	92.2	24.2	S quad.	2	7.7	Ci.-S.	Cu. SW	
10.	57.94	27.5	32.6	23.8	87.3	23.4	SW, SSW	.3	8.2	Ci.-S.	Cu. SSW, SW	
11.	58.06	27.5	32.8	23	85.7	23.3	S, SSE	.7	4.3	Ci.-S.	Fr.-Cu. SSW	
12.	58.40	27.2	33.2	22.9	86.5	23.2	Variable	1	5	Ci., Ci.-S.	Cu. SW	1.5
13.	58.06	27.2	32.3	22.7	91.7	24.6	SE, S	.8	8.5	Ci.-S.	Cu. S	
14.	55.70	25.8	28.4	24	97	24	S	1.7	10	Ci.-S.	Fr.-N.	16
15.	54.75	25.2	26.8	23.7	95	22.6	SSW	3.7	10	N.	SW	14.8
16.	55.86	27.1	30	24	85.7	22.9	S	3.5	9.8	Ci.-S.	Fr.-N. SSW	5.3
17.	57.72	27.3	31.2	23.5	84.8	22.8	S	1.7	8.3	Ci.-S.	Cu. S	
18.	57.68	28.3	31.8	25.3	83.2	23.6	S	2.2	4.7	Ci., Ci.-Cu.	Cu. SSW	
19.	57.42	28.4	31.4	25.4	82.8	23.5	S quad.	2.2	2	Ci.	Cu. W	
20.	57.90	28.8	33.3	25	79.2	22.9	S quad.	1.2	3.3	Ci.	Cu. SW	
21.	57.71	28.6	33.4	24.9	82	23.6	S	1.2	3.8	Ci.-S.	Cu. SW	3
22.	57.16	27.2	30.7	25	86.2	22.9	SW	1.3	8.8	Ci.-S.	Fr.-N. W	2
23.	56.58	26.6	29.9	23.9	89.2	23	S quad.	2.8	9.3	Ci.-S.	Cu. SW, SSW	3.8
24.	56.86	26.4	28.4	22.8	84	21.5	S	1.3	9.8	Ci.-S.	Cu. SW	34.6
25.	57.59	27.7	32	23.5	83	22.6	S	1	6.8	Ci.-S., Ci.	Cu. SSW	
26.	57.99	27	30.7	23.8	90.5	23.9	S	1.2	7	Ci.	Cu. S	4.9
27.	57.03	26	29	23.4	91.7	22.8	SW	1.2	9.3	Ci.-S.	Variable W	16.5
28.	56.20	25.6	29.9	23	89.2	21.8	SW	2.3	9.5	Ci.-S.	Variable W	27
29.	56.38	27.9	30.7	25.3	82.2	22.9	SSW, SW	3	6.8	Ci.-S.	Cu., Fr.-Cu. W	
30.	57.45	28.7	31.8	24	80	23.2	S	1.7	4.8	Ci.	Cu. SW	21.3
31.	57.69	27.7	32.6	22.5	81	22	S quad.	1.5	4.7	Ci.	Cu. W	
Mean	757.54	27.1	31.3	23.7	87.5	23.2		1.5	6.6			
Total												208

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	758.11	27.8	33.1	23.2	78.2	21.5	E, ENE	121.7	5.3	Ci.-S.	Cu.-N. SE	2.8
2.	58.72	27.2	32	23.2	81	21.6	E	134.1	5.8	Ci.-S.	Cu.-N. SE	7.4
3.	58.87	26.3	31.7	23.2	81.3	20.6	ENE	119.2	6.8	Ci.-S.	Cu.-N. SE	2.3
4.	58.13	27.2	31	23.5	81.3	21.7	E quad.	197.8	6.3	Ci.-S.	Cu.-N. SE	
5.	57.84	25.9	28	23.9	85.2	21	E	132	5.7	Ci.-S.	Cu.-N. SE	4.6
6.	58.24	26.4	30.4	22.7	82	20.8	W, SW	133.9	6.5	Ci.-S.	Cu.-N. SE	17.1
7.	58.52	26	29.9	23.7	82.5	20.6	W	114.8	8.5	Ci.-S.	Fr.-N. SE	16.8
8.	58.16	26.8	32.3	22.9	81.8	21.2	W quad.	144.6	6.5	Ci.-S.	Cu.-N. SE	24.9
9.	58.06	27.7	31.5	23.1	75.3	20.6	W, SW	212.2	7.2	Ci.-S.	Cu.-N. SW	2.5
10.	57.70	26.7	30.7	24.1	80.7	20.9	SW	198.2	6.2	Ci.-S.	Cu.-N. SW	1.5
11.	57.78	27.7	32.7	23.7	76.7	20.8	SW	194.9	5.5	Ci.-S.	Variable	
12.	58.11	27.7	31.9	23.9	78.3	21.4	W	170.4	4.5	Ci.-S.	NE	
13.	57.71	27.4	31.3	24.4	80	21.4	W, NW	163.5	6.5	Ci.-S.	Cu.-N. SE, W	40.6
14.	54.72	24.9	25.8	23.4	85	19.9	W quad.	420.4	10	Ci.-S.	N. W	46.4
15.	53.74	27	29.5	24.4	74.2	19.6	SW	486.1	9.8	Ci.-S.	N., Cu.-N. SW	4.5
16.	55.58	28.1	32.5	25	69.8	19.7	SW, SSW	324.9	8.5	Ci.-S.	Cu.-N. SW	1.3
17.	57.21	28.8	33.3	24.3	68.5	20	SW, SSW	247.1	7	Ci.-S.	Cu.-N. W	
18.	57.40	28.8	34.8	24.7	68.8	19.8	SW	232.2	5.8	A.-Cu.	NW	
19.	57.04	29.2	33.2	25.6	71	21.1	W	226.8	5	Ci.	E	
20.	57.44	29.3	33.3	26.7	71.2	21.4	WSW	246.1	4.7	A.-Cu.	S	
21.	57.15	29.5	33.4	26.9	67.7	20.6	SW quad.	364.2	7.7	Ci.-S.	NE	
22.	56.60	28.7	32.1	26.8	72.8	21.3	W, WSW	341.2	9.3	Ci.-S.	Cu.-N., S.-Cu. WSW	
23.	55.79	28.2	32.4	26.1	72	20.3	WSW, SW	466.8	9.3	A.-Cu.	Variable SW	1.5
24.	56.54	27.6	32.1	24.8	69	18.8	WSW	336.8	9.7	A.-Cu.	SE	.8
25.	57.53	27.3	31.7	24.9	71.7	19.2	WSW, WNW	120.2	9.5	Ci.-S.	Cu.-N. SW	
26.	57.74	26.9	29.8	23.7	82.3	21.6	W	244.5	9.7	Ci.-S.	Cu.-N. SW	3.6
27.	56.30	27.2	29.1	24.6	77.8	20.9	W	469.8	9.7	Ci.-S.	Cu.-N. SW	5.6
28.	55.40	27.5	30.8	24.5	72.3	19.7	SW	540.5	9.2	Ci.-S.	Fr.-N. SW	.5
29.	55.92	29.8	34.4	26.5	58.2	18	SW quad.	284.4	7.2	A.-Cu.	S.-Cu. SW	
30.	57.24	29.6	36	25	62.7	19	SW quad.	246.1	7.3	A.-Cu.	S.-Cu. SW	
31.	57.25	28.8	33.9	24.8	69	19.9	WSW	345.3	2.5	A.-Cu.	S Cu. SW	
Mean	757.18	27.7	31.8	24.5	75.1	20.5		257.4	7.2			
Total								7,980.7				184.7

<sup>a</sup> All the mean values given in these tables are deduced from six daily observations.<sup>b</sup> From 19th to 31st, the minimum temperatures are taken from a self-registering apparatus owing to the ordinary minimum thermometer being defective.

*Meteorological data for first and second class stations—Continued.*

**CEBU.**

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	758.54	28.2	31.5	24.8	74.3	21	NW	165.4	4.8	Ci., Ci.-S.	Cu.	E		☉ a. ↙ a. p.	
2.	59.28	27.1	31	24.4	80.3	21.2	SW, NW	204.1	4.8	Cl.	Cu., Cu.-N.	E	26.4	☉ a. a. p. ↗ a. p.	
3.	59.04	28.5	32.5	24.2	76	21.7	NE	205.9	5.7	Ci.-S.	Cu.	E	4.1	☉ a. ↙ a. ↘ p.	
4.	58.10	27.6	31.5	23.7	78.2	21.2	N quad.	256.6	6.2	Ci.	Cu.	E	1	☉ a. a. ↙ a. p.	
5.	57.73	28.2	31.5	25.5	75.5	21.3	Variable	161.5	4.7	Ci.	Cu.	E		☉ a. ↙ p.	
6.	58.04	27.5	29.6	25.6	79	21.4	SW quad.	299.3	6.2	Ci.-S.	Cu.-N.	E		☉ a. ↘ p.	
7.	58.43	27.7	31.2	24.9	73.7	20.1	W quad.	291.2	4	Ci.	Cu.	SW		☉ a. ↘ p.	
8.	58.07	28.2	30.9	25.4	74.5	21.2	SW quad.	295	5.2	Ci.-S.	Cu.-N.	W	6.9	☉ a. ↘ p.	
9.	58.30	26.2	30.3	23.6	84.7	21.4	Variable	397.7	6.8	Ci.	Cu.-N.	SW	30.2	☉ a. a. ↘ p.	
10.	58.04	27.2	30.8	25.1	77.5	20.7	SW	232.6	8.3	Ci.-S.	Cu.	SW, W		☉ a. a. ↘ p.	
11.	57.86	27.6	30.4	25	75.7	20.7	SW quad.	280.5	3.3	Ci.	Cu., Cu.-N.	W		☉ a. a. ↘ p.	
12.	58.23	28.2	32.9	24.5	76	21.5	Variable	235.1	5	Ci.	Cu.		13.7	☉ a. a. ↘ p.	
13.	57.76	27.3	30.2	24.7	83.3	22.3	NW	160.1	8	Ci.-S.	N.-cf. NNW		6.1	☉ a. p. ↗ a. p.	
14.	55.15	26	27.4	23.9	86.7	21.6	SW, W	484.4	10		N.	W	28.6	☉ a. p. ↗ a. p.	
15.	53.64	25.9	27.5	23.8	84.5	21	SW	1,052.9	9.2		Cu.-N., N.	SW	3	☉ a. p. ↗ p.	
16.	55.40	27.3	29.5	23.8	78	21.1	SW	1,352.8	7.8	Ci.-S.	Cu.-N.	SW		☉ a. p. ↗ p.	
17.	57.21	27.8	29.9	24.2	75.2	20.9	SSW	1,043.7	6.8	Ci.-S., A.-Cu.	Cu., Cu.-N.	SW	7.1	☉ a. p. ↗ p.	
18.	57.15	28.7	30.4	27	73.2	21.3	SW		5.2	A.-Cu.	Cu.	SW		☉ a. p.	
19.	57	28.4	30	26.5	69.2	20	SW		2.7	Ci.	Cu.	SW		☉ a. p.	
20.	57.60	28.5	30.2	26.6	69.5	20.1	SW	643.1	3.2	Ci.	Cu.	SW		☉ a. p.	
21.	57.37	28.8	30.3	26.8	71.8	21.2	SW	617.1	3.8	Ci.	Cu.	SW	.8	☉ a. p.	
22.	56.72	27.4	29.3	25.4	73.7	20	SW	666.6	8.2		Cu.-N. W quad.			☉ d° a. p.	
23.	55.88	26	29	23.9	79.3	19.8	SW	768.7	8.7		Cu.-N. WSW		5.9	☉ a. p. d° p.	
24.	56.42	26.8	29.2	24.2	72.8	19	SW	778.8	8.3		s.-cu., cu.-N. sw			☉ a. p.	
25.	57.47	27.9	30.5	25.7	76.2	21.2	SW quad.	495	6.3	A.-Cu.	NNE	Cu.	.5	☉ a. p.	
26.	57.87	27.2	29.5	24.6	78.3	20.9	SW	411.6	8	A.-Cu.	Cu.-N.	W, WSW	6.3	☉ a. a. p.	
27.	56.67	27.4	29	24.7	77	20.8	SW	610.3	8.3		Cu.-N.	WSW	.5	☉ a. a. p.	
28.	55.48	26.7	29.5	24.5	71.7	18.6	SW	840	8.5	Ci.-S.	Cu.-N.	SW	.3	☉ a. a. p. ↗ p.	
29.	55.70	27.9	30.1	26.4	74.7	20.8	SW	1,207.3	7.7	Ci.-S.	Cu.	SW		☉ a. a. p.	
30.	57.17	28.4	30	25.5	73.5	21.2	SW	737.6	5.8	A.-Cu.	Cu.	SW		☉ d° a. p.	
31.	57.52	28.5	31.8	25.5	68	19.5	SW	606.4	3.7	Ci., A.-Cu.	Cu.	SW		☉ d° a.	
Mean	757.25	27.6	30.2	25	76.2	20.8		534.5	6.3						
Total													142.2		

**ILOILO.**

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. et.	mm.		Km.	0-10.				mm.	
1.	758.54	26.3	29.4	24.6	86.2	21.8	Variable	182.4	8.2	Ci.-S.			3	☼ d a. ☐ ☐ p.
2.	59.21	27	31.5	22	79.7	20.7	NE quad.	148.9	6.2	Ci., Ci.-S.		E	8.6	☐ ☐ ☐ ☐ ☐ p.
3.	58.92	26.8	32.3	23.5	79.9	20.6	NE	180.5	7.2	Ci.-S.				☐ ☐ ☐ ☐ ☐ p.
4.	58.06	27.1	31.5	24.2	80.3	21.5	N	293.5	6.7	Ci., Ci.-S.				☐ a. p. ☐ ☐ ☐ p.
5.	57.34	27.7	32.9	23.9	75.3	20.6	N	278.8	5.8	Ci.		NE		☐ a. ☐ ☐ ☐ p.
6.	57.82	25.9	30.7	24.5	87.3	21.5	Variable	115.2	8.7	Ci.-S.			18.8	☐ a. ☐ ☐ ☐ ☐ p.
7.	58.24	26.8	30.9	24	81.2	21.1	SW	212.3	4.8	Ci.			1.3	☐ a. d a. p.
8.	58.05	27.7	30.4	24.9	78.2	21.4	SW	223.1	6.3	Ci.		SW		☐ a. ☐ p.
9.	57.84	27.2	30.9	25.5	78.7	21.1	SW	356.8	7.5	Ci.-S.				☐ a. p. d p.
10.	57.68	27.2	29.9	25.5	75.5	20.2	NW		8.5	Ci.-S.				☐ p.
11.	57.74	27.6	31.7	23.4	73.3	19.9	NW		6.2	Ci.				☐ d ☐ p.
12.	58.10	26.8	31.8	23.4	76.8	19.9	NE, N		7.2	Ci., Ci.-S.				☐ ☐ ☐ p.
13.	57.80	26.8	31.7	23.9	80.1	20.7	NW	128.7	8.2	Ci.-S.				☐ a. d ☐ a. p.
14.	55.38	25.3	27.1	24.4	88.8	21.3	NW, SW	204.6	10	Ci.-S.		SW	44.5	☐ a. p.
15.	55.42	25.4	27.1	22.3	84.9	20.7	SW	702.7	10				45.7	☐ a. p.
16.	54.82	26.5	28.1	22.3	84.4	21.6	SW	720	10	Ci.-S.		SW	37.4	☐ a. p.
17.	56.58	27.8	30.2	22.1	75.7	21.5	SW	574.6	9.5	Ci.-S.		SW	19	☐ a. p. ☐ p.
18.	57.01	27.7	30.3	22.7	82.7	21.8	SW	526.8	8.7	Ci.-S., Ci.		SW	14.2	☐ a. p. d ☐ p.
19.	56.88	27.6	30	22.8	81	22.1	SW	505.2	9	Ci.-S.		SW	15	☐ a. p. ☐ p.
20.	57.49	28.3	30.3	24.5	79.5	22.7	SW	458.2	8.8	Ci.-S.		Cu.	6.9	☐ a. p.
21.	57.51	27.7	30	25.1	83	22.9	SW	462.5	9.7	Ci.-S.		SW	15	☐ a. p. ☐ p.
22.	56.90	25.8	28	24	85.5	21.1	SW, S	313.1	10	Ci.-S.		SW	19.2	d a. p. ☐ p.
23.	55.92	24.9	27.2	22.6	91	21.3	SW	398.8	10	Ci.-S.			142.8	☐ a. p. ☐ ☐ p.
24.	56.14	25.9	28	22.1	84.5	20.9	SW	469.1	9.7	Ci.-S.			9.2	☐ a. ☐ a. p.
25.	57.28	27	30	22.4	82.2	21.8	SW	377.2	9.7	Ci.-S.			26.4	☐ a. p.
26.	57.73	26.8	29.5	24	86.2	22.6	S	272	9	Ci.-S.			6.3	☐ a. p.
27.	56.75	27.2	29	23.7	83.3	22.3	SW	408.3	10	Ci.-S.			13.7	☐ a. p. ☐ p.
28.	55.68	26	27.5	22.8	83.2	20.6	SW	540.1	10	Ci.-S.			33.1	☐ a. p. ☐ p.
29.	54.98	27.3	29	24	81.5	21.9	SW	657	10	Ci.-S.			13.2	☐ a. p. ☐ p.
30.	56.74	27.3	29.9	22.9	82.5	22.1	SW	547.2	10	Ci.-S.			21.8	☐ a. p. d ☐ p.
31.	57.38	26.5	30.1	22.4	83.5	21.4	SW	341.6	7.8	Ci.-S.				
Mean	757.09	26.8	29.8	23.5	81.8	21.3		378.5	8.5					
Total													518	

**ORMOC.**

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a.m.	Miscellaneous.
			Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
											Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-1.0					mm.	
1.	753.60	26.2	31.9	22.8	86.8	21.6	Variable	124.5	6.3	Cl.-S.		Cu.-N.	SSW	16.5	☉ a. T. ● ☐ 4 p.
2.	59.38	25.3	31.9	22.2	90.2	22.2	NW	106.2	5.8	A.-Cu.	E	Cu.	E	13.4	☉ 2 a. T. ● a. p. ☐ p.
3.	59.23	26.1	31.7	22.8	85.7	21.3	NW quad.	142.1	6.7	Cl.		Cu.	E	15.4	☉ 2 a. T. ● ☐ p p.
4.	58.29	26.7	32	22.9	86.8	22.5	NW	107.8	7.3	Cl.-S.		Cu.	E		☉ a. ☐ p.
5.	57.93	26.1	30.5	22.3	84.5	21.1	N quad.	125.4	6	A.-Cu.	SE	Cu., Cu.-N.	E	13.2	☉ p d. ● a. ☐ p.
6.	58.30	26.4	30.5	22.7	86.3	22.1	Variable	133.6	9.3	Cl.-S.	E	Cu.	ENE	2.3	☉ a. d. a. p. T. ☐ p
7.	58.58	27.4	30.6	22.4	79.5	21.3	NE, SE	147.9	4.8	Cl.-S.		Cu.-N.			☉ a. ☐ p.
8.	58.24	27.6	31	23.6	84.4	22.9	E quad.	112.2	8.7	Cl.-S.		Cu.-N.		14.2	T d ☐ ☐ ● p.
9.	58.46	25.8	30.3	22.8	86.8	21.2	Variable	133.4	7.5	Cl.	NbyE	Cu.-N.		55.6	T d ☐ ☐ ☐ p.
10.	58.10	26	29.9	22.6	88.5	22.2	Variable	104.5	8.8	Cl.-S.		Cu.-N.	W	1	d a. p. T. ☐ ☐ p.
11.	58.01	27.1	30.5	23.3	81.3	21.7	N	98.6	6.8	Cl.-S.		Cu.-N.	W	3.3	☐ p d T ☐ ☐ p.
12.	58.56	27.1	31.2	23.2	83.3	22	N, NNW	101.3	8.3	A.-Cu.	NW	Cu.-N.		.5	☐ a. p. ☐ p.
13.	57.80	26.9	31.3	23.3	83.5	21.8	N, NNW	142.2	7.5	Cl.-S.		Cu.-N. NNW, NW		16.4	☐ a. p. ☐ 4 p.
14.	54.68	24.3	30.4	23.2	96.7	21.8	W quad.	274.7	10			N. NNW		318.6	☐ a. ● 2 a. p. ☐ p.
15.	53.37	26.6	27.8	24.3	85.5	22.1	SSW	999.7	10	Cl.-S.		Cu.-N. N. SW		.3	● 2 ☐ a. p. p.
16.	55.56	27.7	30.3	23.5	78.7	21.8	S	721.8	10	Cl.-S.		Cu.-N.	S	16.5	d a. p. ● p.
17.	57.30	27.8	29.8	24.5	81	22.6	SE quad.	531.9	8.8	Cl.-S.		Cu.-N.			☐ ☐ ☐ p.
18.	57.29	29.4	31.5	27.2	79.2	24.2	S	463.2	6.3	A.-Cu.	E, SSE	Cu.	SW		
19.	57.18	29.5	31.8	27.1	80	24.4	S	435.6	6.5	Cl.-S.		Cu.-N.	WSW		
20.	57.68	28.5	31.2	25.7	86	24.8	SE quad.	278.1	4.2	A.-Cu.	N, W	Cu.	W		
21.	57.52	28.6	30.6	25.9	84.7	24.6	SE quad.	279.6	6.7	Cl.-S.	E	Cu.-N.	sw quad.		☐ p.
22.	56.84	28.2	31.3	25.7	84.5	24.4	S	247.3	8.5	Cl.-S.	E	Cu.-N.	W	34.8	p ☐ 4 ● ☐ p.
23.	55.88	27	30.1	25.1	88	23.3	S quad.	377.3	9.3	Cl.-S.		Cu.-N.	WSW	24.9	☐ ● d ☐ p.
24.	56.51	28.2	30.2	26.2	80.2	22.7	S	481.5	9.8	Cl.-S.		Cu.-N.	WSW, W		d 4 a.
25.	57.60	28.6	30.7	26.9	82.2	23.9	SE, S	290.1	7.5	Cl., A.-Cu.	E	Cu., Cu.-N.	ws w	19.3	☐ 4 a.
26.	58.04	27.2	30	24.2	87	23.4	Variable	124.2	9.2	Cl.-N.		Cu.-N. N, NNW		6.1	● ☐ 4 a. p.
27.	56.81	26.7	29.2	24.9	83.8	23	NE, E	89.2	9.8	Cl.-S.	E	Cu.-N.	W, WW	20.3	● p ☐ 4 p.
28.	55.64	26.9	29.8	25	86	22.6	SW quad.	356	10	Cl.-S.		Cu.-N. W, WSW		2.3	d a. ☐ 4 p p.
29.	56	29.4	31.1	27.5	78	23.6	S	736.7	9.5	Cl.-S.	N	Cu.-N.	SSW		
30.	57.34	29.4	31	27.4	81.3	24.8	SSE	407.6	7.8	A.-Cu.	E	Cu.-N. sw, wsw		1.5	
31.	57.74	28.8	31	26.5	85.7	25.2	SE	253	6.7	A.-Cu.	ENE, E	Cu.-N. ssw, wsw			d a. ☐ p.
Mean	757.37	27.4	30.7	24.4	84.6	22.8		288	7.9						
Total								8,927.2						596.4	

NOTE.—For Ormoc the temperature, relative humidity and vapor pressure records from July 18-31 are taken from the self-registering apparatus.

**TACLOBAN.**

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.					
										Upper.		Lower.			
1.	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.						
2.	758.66	26.7	32.4	24.2	85.2	22	E	0.8	5.3	Cl.-S.	NW	Cu.-N.	ESE	mm.	2 a. T p.
3.	59.24	26.8	30.4	24.4	86.2	22.4	Variable	.3	5.5	Cl.-S.	NW	Cu.-N.	SE	-----	2 a. p. < p.
4.	59.24	26.6	32.6	23.3	84.5	21.7	ESE, NNW	.3	7.3	Cl.-S.	NW	Cu.-N.	E	2.5	T d <sup>2</sup> p.
5.	58.37	26.7	32.7	23.6	88.2	22.6	NW, ESE	.3	4.5	Cl.-S.	NW	Cu.	ESE	9.7	2 a. p.
6.	57.78	26.4	31.4	24.2	85.5	22.5	NW	.7	5.7	Cl.-S.	NW	Cu., Cu.-N.	ESE	12.7	2 a. p.
7.	57.94	27	31.7	24.2	85.5	22.5	ESE, SSW	.5	5.7	Cl.-S.	NW	Cu.-N., Cu.	ESE	-----	2 a. p.
8.	58.15	27.6	31	24.4	83	22.6	NW, ESE	.7	5.2	Cl.-Cu.	NW	S.-Cu.	ESE	4.3	2 a. p.
9.	58.03	26.6	30.4	24	87.5	22.6	E	.7	8.5	Cl.-N.	NW	Cu.-N.	S quad.	1.5	2 a. p.
10.	57.86	26.9	32.4	22.7	82	21.4	NW quad.	1	7.5	Cl.-N.	NNE	Cu., Cu.-N.	WSW	9.7	2 a. p.
11.	57.60	25.8	30	23.6	87.7	21.6	NW quad.	.8	7.2	Cl.-N.	NW	Cu.-N.	W	244.3	2 a. p.
12.	57.60	27.5	32.4	24.2	83.3	22.3	NNW	.7	7.2	Cl.-N.	NE	Cu.	SW, WSW	27.3	2 a. p.
13.	58.12	27.5	32.7	24	82.5	22.2	NNW	1	7.7	Cl.-N.	SE	Cu.	WSW	9.1	2 a. p.
14.	57.47	27.6	32.7	24.4	82.2	22.4	NNW	1	8.2	Cl.-N.	SE	Cu.-N.	N	-----	2 a. p.
15.	53.92	24.8	26.1	23	94.2	21.9	W quad.	2	10	-----	-----	N.	NW	9.1	2 a. p.
16.	52.56	24.5	25.8	23.8	91.2	20.9	S	1.7	10	Cl.-	-----	N.	SW	27.3	2 a. p.
17.	54.83	27	30.2	23.8	75.5	19.8	SSW	2.3	8.7	Cl.-	-----	N., Cu.	SW	9.1	2 a. p.
18.	56.66	27.7	32.4	23.8	74.2	20.4	S	.8	8	Cl.-Cu.	N	Cu.-N.	SW	-----	2 a. p.
19.	56.61	29.3	33.7	25	64.5	19.4	SSW	1.7	6.3	Cl.-Cu.	N	Cu.	WSW	-----	2 a. p.
20.	56.45	29.8	33.6	26	60.8	18.8	SW	2.2	5.3	-----	-----	Cu.	WSW	-----	2 a. p.
21.	56.92	29.6	34.4	25.3	64.8	19.8	SW	1.2	3.5	Cl.-	-----	Cu.	SW, WSW	-----	2 a. p.
22.	56.84	28.9	34	24.2	70	20.4	NNW	1	6.3	Cl.-	NE	S.-Cu.	W	5.6	2 a. p.
23.	56.07	27.2	32.5	23.6	82.2	21.8	NW quad.	.8	8.2	Cl.-	NE	Cu.	WSW	6.9	2 a. p.
24.	55.09	26.8	31.9	24.2	82.8	21.6	NW, S	.3	8.3	Cl.-	-----	Cu.-N.	WSW	1.3	2 a. p.
25.	55.96	27.3	31.5	24	75.2	20.2	SSW	.7	8.3	-----	-----	Cu.-N.	WSW	-----	2 a. p.
26.	56.98	28.1	32.7	23.6	74.5	20.8	NNW	1	7.5	Cl.-Cu.	NE	Cu.	WSW	-----	2 a. p.
27.	57.32	27.9	32	25	73.8	20.4	NNW	1.3	8	Cl.-Cu.	NE	Cu.	W	4.3	2 a. p.
28.	55.81	27	29.2	25	79.5	21.2	NNW	1.5	8.5	A.-S.	-----	Cu.-N.	W, NNW	5.9	2 a. p.
29.	54.79	26.6	30.4	24	77.7	20	W quad.	1.2	8.7	Cl.-S.	-----	N.	WbyN, SW	-----	2 a. p.
30.	55.35	28.2	32.6	24.5	67.7	19.1	SSW	2.2	8.2	Cl.-S.	N	Cu.	SW quad.	-----	2 a. p.
31.	56.70	29	33.6	25.9	65.8	19.3	SSW	1.8	7.5	Cl.-S.	NNW	Cu.	SW	-----	2 a. p.
31.	56.95	28.8	34	24.5	66.8	19.3	SW quad.	1.5	4.7	Cl.-Cu.	-----	Cu.	SW	-----	2 a. p.
Mean	756.83	27.4	31.7	24.2	78.9	21.1		1.1	7.2						
Total														355.9	

*Meteorological data for first and second class stations—Continued.*

**CAPIZ.**

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied,  $-1.81$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.	Km.	0-10.				mm.		
1.	758.50	26.4	31.9	23	86.2	21.8	Variable	122.3	7.3	Ci.-S.	Fr.-N.	W	1	☉ a. ☐ ☐ p.
2.	59.16	26.5	32.8	23	86	22	Variable	89.6	5.8	Ci.	N.	N		☐ a. ☐ a. p.
3.	58.98	26.7	31.8	23	86.2	22.3	Calm	79.2	7	Ci.-S.	N.	E	6.3	☐ a. ☐ a. p.
4.	58.37	26.2	29.9	24	90	22.7	N	60.9	8.7	Ci.-S.	N.	NE	55.3	☐ a. ☐ a. p.
5.	57.70	27.2	32.3	23	87	23.1	Variable	120	7.5	Ci.-S.	N.	SE	40.2	☐ a. ☐ a. p.
6.	57.91	25.6	31.5	23	88	22.2	NE quad.	64.6	9.2	Ci.-S.	N.	E	23.6	☐ a. ☐ a. p.
7.	58.12	27.1	33.4	23	82.7	21.7	SE, S.	114.8	4.5	Ci.	N.			☐ a. ☐ a. p.
8.	57.99	27.1	32.9	23	83.3	22	NNW, SSE	118.6	4.8	Ci.	Fr.-N.	SE		☐ a. ☐ a. p.
9.	57.76	26.8	33.3	23	86.2	22.4	Variable	94.3	6.3	Ci.-S.	N.	SE	.8	☐ a. ☐ a. p.
10.	57.63	26.8	31.5	23	88	21.1	WSW, W	107.2	7.3	Ci.	N.	W		☐ a. ☐ a. p.
11.	57.81	26.5	33.2	23	84	21.4	W, NE	81	6	Ci.-S.	Fr.-N.	W		☐ a. ☐ a. p.
12.	58.24	27.4	33.4	23	79.2	21.2	NNW	119.8	8.7	Ci.-S.	N.			☐ a. ☐ a. p.
13.	57.73	27.5	32.5	24	83.3	22.6	N, NW	114.4	7.8	Ci.-S.	N.			☐ a. ☐ a. p.
14.	55.10	25.8	28.7	23	93.2	23	NW	200.7	10	Ci.-S.	N.	NW	89.4	☐ a. ☐ a. p.
15.	52.74	23.6	26.3	23	97.2	21	SW, SSW	213.7	10	Ci.-S.	N.	W	55	☐ a. ☐ a. p.
16.	54.50	24.6	27.8	22	94.7	21.8	SW	81.9	10	Ci.-S.	N.		8.4	☐ a. ☐ a. p.
17.	56.10	26.8	33.8	22	80.7	20.7	S	180.7	9.5	Ci.-S.	N., Fr.-N.	S, SW	.5	☐ a. ☐ a. p.
18.	56.35	28	33.8	23	77.5	21.5	S quad.	212.9	7.8	Ci.-S.	N., Fr.-N.	SW		☐ a. ☐ a. p.
19.	56.17	27.5	33.5	22	78.3	21	SSW, S	113	6.3	Ci.	Cu.	SW		☐ a. ☐ a. p.
20.	56.97	27.7	34	23	78.3	21.3	SSW	109	6.3	Ci.-S.	N.	SW		☐ a. ☐ a. p.
21.	56.95	28.1	33.8	24	78.2	21.8	SW	107.6	7.7	Ci.-S.	N., Fr.-N.	sw, w	1	☐ a. ☐ a. p.
22.	56.74?	24.9	33	23	91.3	21.4	W	131.3	9	Ci.-S.	N.	W	25.1	☐ a. ☐ a. p.
23.	55.35	24.4	28	23	93.7	21.2	SW	138.4	9.8	Ci.-S.	N.		2.6	☐ a. ☐ a. p.
24.	55.66	25.3	29	23	88.3	21.1	SW quad.	144.7	10	Ci.-S.	Fr.-N.	SW	3	☐ a. ☐ a. p.
25.	56.84	27.5	33.8	24	79.2	21.3	S	157.6	8	Ci.-S.	Cu., Fr.-N.	SW		☐ a. ☐ a. p.
26.	57.54	27	32.8	23	84	22	SW, NW	134.8	8.7	Ci.-S.	Fr.-N.	NW	4.1	☐ a. ☐ a. p.
27.	56.71	26.2	32.8	24	86.5	21.9	NW, W	107.8	10	Ci.-S.	N.	NW	6.4	☐ a. ☐ a. p.
28.	55.23	25.5	28.3	23	85	20.6	SW quad.	148.6	10	Ci.-S.	Fr.-N. WSW, W	SW	.6	☐ a. ☐ a. p.
29.	54.30	26.2	30.5	23	84.7	21.3	SW	226.1	9.7	Ci.-S.	Fr.-N.	SW		☐ a. ☐ a. p.
30.	56	27.7	34	25	76	20.8	SW	240.5	9	Ci.-S.	N.	SW		☐ a. ☐ a. p.
31.	56.77	27.2	33.5	23	79.7	21.2	SW	163.6	3.8	Ci.	Cu.	SW	2	☐ a. ☐ a. p.
Mean	756.84	26.5	31.9	23.5	85	21.7		132.2	8					
Total								4,099.6					345.3	

**CALBAYOG.**

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.80$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.	
1.	758.98	26.3	31.7	23	87	21.9	N quad.	149.5	3.3	Ci.-S.	S.-Cu.			0.5	↑ d° p.
2.	59.06	26.2	31.2	22	87	21.9	N	125.6	3.5	Ci.-S.	Cu.	E		0.5	↓ a. ↗ d° a. ↗ d° p.
3.	58.99	26.5	30.1	22	90	25.5	N	109.4	5.3	Ci.-S.	Cu.	E		2.0	↓ a. ↗ d° a. ↗ d° p.
4.	58.19	26.4	31.7	23	87	22.2	N	135.9	6.2	Ci.-S.	S.-Cu.	E		2.0	↓ a. ↗ d° a. ↗ d° p.
5.	57.80	26.6	30.7	23	90	26.8	S, N	120.3	5.5	Ci.-S.	S.-cf.	E		2.0	↓ a. ↗ d° a. ↗ d° p.
6.	58.01	26.2	31.3	22	88	22.2	N	139	6.7	Ci.-S.	Cu.-N.			2.0	↓ a. ↗ d° a. ↗ d° p.
7.	58.29	27.2	33.7	22	85	22.2	Variable	144	4.2	Ci.-S.	Cu.			2.5	↓ a. ↗ d° a. ↗ d° p.
8.	57.95	27.6	31.9	24	85	23.3	NW quad.	131.8	5.2	Ci.-S.	S.-Cu.	SW		2.5	↓ a. ↗ d° a. ↗ d° p.
9.	57.73	27.8	32	25	84	23.3	W quad.	209	6.7	Ci.-S.	S.-Cu.	SW		2.5	↓ a. ↗ d° a. ↗ d° p.
10.	57.66	27.4	30.6	24	84	23.3	WSW	209.6	7.7	Ci.-S.	S.-Cu.	WSW		5.6	↓ a. ↗ d° a. ↗ d° p.
11.	57.67	27.5	32.1	25	85	23.3	W quad.	176.1	7.3	A.-Cu., Ci.-S.	S.-Cu.	W		5.6	↓ a. ↗ d° a. ↗ d° p.
12.	58.29	27.1	31.2	24	87	23.3	W quad.	161.3	7.3	Ci.-S.	S.-Cu.	W		5.6	↓ a. ↗ d° a. ↗ d° p.
13.	57.60	27.3	32.6	23	85	23.3	NNW	127.8	7.7	Ci.-S.	Cu.	NNW		3.5	↓ a. ↗ d° a. ↗ d° p.
14.	53.96	25.4	28.9	23	84	22.7	NW	119.9	10	Ci.-S.	N.	NNW		128.9	↓ a. ↗ d° a. ↗ d° p.
15.	50.91	25.5	26.7	24	90	22.7	S	1,298.7	10	Ci.-S.	S.-Cu.	SSW		52.2	↓ a. ↗ d° a. ↗ d° p.
16.	54.23	26.6	28.2	24	85	22.7	S, SSW	992.9	10	Ci.-S.	S.-Cu.	SSW		1.8	↓ a. ↗ d° a. ↗ d° p.
17.	56.34	27.2	30.4	25	75	21.6	SSW, S	738.9	8.3	Ci.-S.	S.-Cu.	SSW		1.8	↓ a. ↗ d° a. ↗ d° p.
18.	56.46	28.6	30.6	26	75	21.6	SSW	557.5	5.3	Ci.-S.	S.-Cu.	SSW		1.3	↓ a. ↗ d° a. ↗ d° p.
19.	56.46	28.8	30.6	27	74	21.9	SSW, SW	490	5.5	Ci.-S.	S.-Cu.	SW		1.3	↓ a. ↗ d° a. ↗ d° p.
20.	56.96	28.7	30.6	27	74	21.9	SW	452.1	5.7	A.-Cu.	S.-Cu.	SW		1.3	↓ a. ↗ d° a. ↗ d° p.
21.	56.91	28.6	28.9	24	82	21.6	W quad.	413.9	8.3	A.-Cu.	S.-Cu.	WSW		1.5	↓ a. ↗ d° a. ↗ d° p.
22.	56.19	27.5	30	26	81	22.2	SW	556.8	8.5	Ci.-S.	S.-Cu.	SW		2.8	↓ a. ↗ d° a. ↗ d° p.
23.	54.86	27.4	29.1	26	79	21.6	SSW	614.8	10	Ci.-S.	S.-Cu.	SW		2.8	↓ a. ↗ d° a. ↗ d° p.
24.	55.72	28.2	30.9	26	76	21.6	SSW	383.8	8	A.-Cu.	S.-Cu.	W, WNW		2.8	↓ a. ↗ d° a. ↗ d° p.
25.	57.12	28.6	31.8	26	77	22.4	W	313.1	7.8	A.-Cu.	S.-Cu.	W		2.8	↓ a. ↗ d° a. ↗ d° p.
26.	57.47	27.6	28.9	25	81	22.3	W	394.4	9.8	Ci.-S.	S.-Cu.	W		2.8	↓ a. ↗ d° a. ↗ d° p.
27.	54.49	26.2	28.1	23	84	21.2	W quad.	654.8	10	Ci.-S.	N.	W		21.1	↓ a. ↗ d° a. ↗ d° p.
28.	54.74	27.8	29.5	25	76	21.2	S, SSW	903.9	10	Ci.-S.	S.-Cu.	SSW		6.2	↓ a. ↗ d° a. ↗ d° p.
29.	56.61	28.6	30.9	27	75	22	S, SSW	578.5	7.8	Ci.-S.	S.-Cu.	SSW		6.2	↓ a. ↗ d° a. ↗ d° p.
31.	57.03	28.6	32.6	27	75	22	SSW, SW	449.5	3.3	A.-Cu.	S.-Cu.	E		6.2	↓ a. ↗ d° a. ↗ d° p.
Mean	756.71	27.3	30.6	24.9	82.9	22.2		395.1	7.1						
Total														235.6	

## Meteorological data for first and second class stations—Continued.

## LEGASPI.

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	758.50	29	34.4	24	81.3	23.9	NE quad.	111.5	4	Ci.	SW	mm.
2.	59.23	28.4	36.5	23.6	83.5	24	NE	91.2	3	Ci., Ci.-S.	E	5.6
3.	59.11	28	34.2	23.3	82	22.7	NE	138.3	4	Ci.	E	7.9
4.	58.50	28.2	32.9	23	80.2	22.7	ENE, NNE		6.5	Ci.-S.	WNW	2.5
5.	57.89	27.6	33	23.8	83.7	22.8	NE quad.	107.7	4.8	Ci.	ENE	1.3
6.	58.02	27.3	31	24.6	85.7	22.9	NNE		6.3	Ci.-S.	NE	d° a.
7.	58.09	27.6	32.6	23.6	82.5	22.4	NNE		4.3	Ci., Ci.-S.	ENE	1
8.	57.86	27.8	33.1	23.3	82.3	22.5	WSW		5	Ci., Ci.-S.	WSW	7.1
9.	57.28	27	32.6	22.2	82.8	21.9	SW	155.9	4.3	Ci.-S.	W	
10.	57.01	26.6	33.1	24.1	87.3	22.4	SW	190.8	3.7	Ci.	WSW	5.6
11.	57.34	27	31	24	85.7	22.6	WSW	149.9	7.3	Ci.-S.	WNW	2
12.	58.12	27.7	33.9	24.4	81.7	22.2	N, NNE	109.2	5.8	Ci.-S.	WSW, W	1
13.	57.65	28	34.4	23.4	80.2	22.3	NNE	110.9	4	Ci.-S.		1
14.	54.40	26.8	30.8	24	85.3	22.1	N quad.	189.9	9.8	Ci.-S.	NNW	95.1
15.	47.71	25.6	26.8	23.8	90	21.9	W quad.	648.5	10	Ci.-S.	NNW	57
16.	52.62	25	26.3	23.4	91.7	21.6	SW quad.	580.3	10	Ci.-S.	Fr.-N. SW, SSW	62.6
17.	55.06	27.2	31.1	24.6	80	21.3	SW quad.	433.6	8.8	Ci.-S.	N	4.1
18.	55.70	27.9	31.8	24.7	74	20.6	SW, WSW	377	7.5	Ci.-S.	Fr.-N. SSW	4.3
19.	55.63	27.6	31.7	24.6	80.3	22	WSW	378.8	3.3	Ci.	Fr.-Cu. WSW	5.6
20.	56.24	27.6	31.6	24.5	78.7	21.4	SW, WSW	423.1	4.5	A.-Cu., Ci.	Cu. WSW	1.3
21.	56.38	26.8	31.6	23.5	82.8	21.7	SW quad.	399.8	7.5	Ci.-S.	Cu.-N. WSW	2
22.	55.31	26.9	30.5	23.4	81	21.2	WSW, SW	282.6	8	Ci.-S.	Fr.-N. W, WSW	4.1
23.	53.98	26.5	30.5	23.6	83.7	21.4	SW	265.1	8.3	Ci.-S.	Fr.-N. SW	6.4
24.	54.68	26.4	28.9	24.4	84.7	21.7	SSW, SW	363.1	8.8	Ci.-S.	Fr.-N. SW	2
25.	56.28	27.3	31.9	24.3	78.8	21.1	WSW		6.5	Ci.-S., A.-Cu. NNW	Cu. WSW	
26.	56.95	27.8	32.3	24.6	77.2	21.3	WSW	303.8	5.8	Ci.-S.	Cu. WSW	
27.	55.61	27.2	30.4	24.8	82	21.9	W, WSW	305.5	8.8	A.-Cu.	Cu. NNW, NW	20
28.	53.26	25.4	27	23.7	90.2	21.7	WSW	447.2	10	Ci.-S.	Fr.-N. WSW	28.9
29.	53.13	26	27.8	23.5	87.3	21.8	WSW	439.9	10	Ci.-S.	Fr.-N. SW	24.5
30.	55.62	27.2	30.9	24.6	84.2	22.3	WSW	327.8	7.2	Ci.-S.	Fr.-N. sw, wsw	1.3
31.	56.39	27.6	31.9	24.5	79.7	21.6	WSW	349.4	2.8	Ci.	Cu. SW	d° a.
Mean	756.11	27.2	31.4	23.9	82.9	22.1		295.4	6.5			
Total												344.6

## ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	758.24	28.3	32.4	23.8	78.7	22.2	N	238.7	5.5	Ci.	Cu. SE, SSE	5.6
2.	59.28	27.6	31	24.6	81.8	22.4	N quad.	302.3	9.5	Ci.-S.	S.-Cu.	5
3.	58.98	28.5	31	24.6	81.5	23.5	NE	276.1	7.7	A.-Cu.	NE	1.8
4.	58.46	27.8	30	25.5	83.3	23.1	N	304.5	7.7	Ci.-S.	NE	6.4
5.	57.86	29	32.6	26.2	80.3	23.8	N	262.6	6.2	Ci.	E	2
6.	57.95	27.4	30.3	25	86.7	23.4	N	244.5	7.3	Ci.-S.	NE	1.8
7.	57.86	27	31.6	24	89	23.4	SW	175	6.7	Ci.	Cu. NE, S	3.8
8.	57.65	27.6	32.4	23.2	82	22.2	SW	263.1	5	Ci.	ENE, E	
9.	57.03	27.5	33	24.1	84.7	22.9	SW	247.2	7.5	Ci.	ENE	
10.	56.93	27.2	32.8	23.5	81.2	21.5	SW	200.5	5.5	A.-Cu.	E	
11.	57.01	27.2	33	22.4	79	20.9	SW	234.3	6.8	Ci.-S.	E	
12.	57.85	26.7	31.7	23.1	84	21.6	SW	202.3	6.8	A.-Cu.	E	
13.	57.64	26.9	31.4	22.9	84.8	22.1	SW	220.4	6.7	Ci.	Variable	
14.	55.26	26.8	30.5	24	87.5	22.9	SW	384.6	9.7	Ci.-Cu.	ENE	
15.	51.84	25.9	27.8	23.6	89.2	22.1	NW	589.5	10	Ci.-S.	N	152.7
16.	52.14	25.4	26.6	23.8	88	21.2	SW quad.	479.3	10	Ci.-S.	W quad.	106.2
17.	54.11	26	27.5	24.2	83.8	21	SW	379.5	10	Ci.-S.	SW	15.7
18.	54.86	27.3	31	24.5	79.7	21.4	SW	296.1	9.7	A.-Cu.	SW	
19.	54.83	27.4	32.2	25.4	78.2	21.1	SW	382.6	8.3	A.-Cu.	SW	
20.	55.62	27.3	30.5	25.2	75	20.2	SW	413.9	9.7	Ci.-S.	SW	
21.	55.94	26.3	31	24.1	82	20.8	SW	439.4	9.3	A.-Cu.	SW	
22.	54.59	26.6	31.7	23.9	80.5	20.6	SW	390	8.5	A.-Cu.	NW	
23.	53.20	27.3	30.9	25	73.5	19.8	SW	414.5	8	A.-Cu.	SW	
24.	53.83	26.5	27.9	24.6	81	20.8	SW	293.3	10	Ci.	S	
25.	55.46	26.8	31	23.9	80.3	20.9	SW	212.6	9.8	A.-Cu.	SW	
26.	56.68	27.8	31.8	24.4	73.8	20.4	SW	156.7	7.7	A.-Cu.	NE	
27.	55.81	26.4	31.4	22.6	81	20.4	SW quad.	161.7	6.7	Ci.	E	
28.	53.12	25.3	26.6	23.4	85.5	20.5	WSW	357.6	10	Ci.-S.	Fr.-N. WSW, W	30.3
29.	51.20	25	26.5	23.1	88	20.6	SW	532.8	10	Ci.-S.	N	7.1
30.	54.08	26.4	29.9	24.2	85.5	21.8	SW	278.1	8.8	Ci.-S.	Fr.-N. NW quad.	20.9
31.	55.61	27.4	31.2	23.9	82.5	22.2	SW	244.8	5.3	Ci.	S.-Cu. sw, wsw	14.2
Mean	755.84	27	30.6	24.1	82.3	21.7		309	8.1			
Total								9,578.5				428.4

## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5 meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1..	758.02	27.1	34	22.5	84.8	22.4	NE	1	6.5	Ci.-S.	SW	Cu.	SE	0.2 a. p.
2..	58.98	27.5	32.8	24	82.5	22.4	NE quad.	1	8.7	Ci.-S.		Cu.-N., S.-Cu.	E	0.2 a. p.
3..	58.81	27.7	33	23.6	82.5	22.4	E quad.	1	7	A.-Cu.	SE	Cu.	E	7.6
4..	58.18	26.8	32.1	23.9	81.8	21.3	ENE	1.3	7.3	Ci.-S.	NNE, NE	Cu.	E	0.2 a. p.
5..	57.50	27.3	33.1	24.7	83.5	22.4	NE	1.2	7	Ci.-S.		Cu.	E	10.5
6..	57.73	26	31.6	23.5	91	22.7	NE	1	6.8	Ci.-S.		Cu.	E	11.1
7..	57.51	27.2	33	23.1	85	22.6	NE, SE	1.2	6.5	Ci.-S.	ENE	Variable	E	0.2 a. p.
8..	57.38	27.8	33.8	23.4	79.7	21.8	NE, SW	1.3	5.5	Ci.-S.		Cu.	E	0.2 a. p.
9..	57.07	28.2	32.3	24	80.7	22.8	SW	1.3	7.5	Ci.-S.		Variable	E	0.2 a. p.
10..	57.08	27.2	32.9	23.3	81.8	21.8	NE	1.8	6.8	Ci.-S.		Cu.	E	0.2 a. p.
11..	57	26.9	32.8	23	83.2	21.8	SW quad.	1.7	6.8	Ci.-S.		Cu.	E	0.2 a. p.
12..	58.02	26.3	31	23	86.5	22	Variable	1.2	8	Ci.-S.	NNE	Cu.	W	1.3
13..	57.60	26.7	32	23	85.5	22.2	NE	1.3	7.8	Ci.-S.	ENE	Cu.-N., S.-Cu.	NE	18.5
14..	55.19	26.5	33	23.5	89.2	22.8	NE quad.	1	9	Ci.-S.		Cu.-N., N.	NE	24.1
15..	52.25	26.1	27.5	24.4	91.5	23	E, SW	1	10	Ci.-S.		N.	NE	12.7
16..	52.48	26.6	28.7	25.2	87.3	22.7	SW	3.7	10	Ci.-S.		N.	NE	13.8
17..	54.10	26	27.1	24.4	90.2	22.4	SW	3.3	9.7	Ci.-S.		N.	WSW	19.8
18..	54.85	27	29.3	25	86.7	22.9	SW	3.5	9.7	Ci.-S.		N.	SW	24.9
19..	54.90	27.2	30.5	24.5	85.8	22.9	SW	3.7	9.5	Ci.-S.		N.	SW	16.3
20..	56.19	25.7	27.4	24.4	90.2	22.2	SW	2.2	10	Ci.-S.		N.	W	54.4
21..	56.40	25.3	27	23	91.2	21.8	SW	2.5	9.7	Ci.-S.		N.	SW, W	5.1
22..	55.10	26.2	30	23.2	87.8	22	SW	2.8	9.2	Ci.-S.		N.	W, SW	3.1
23..	53.49	26.4	29.2	24.5	87	22.2	SW	3	9.7	Ci.-S.		N.	W	9.2
24..	53.62	25.8	27.2	24.2	90.5	22.4	SW	3.2	9.7	Ci.-S.		N.	SW	3.3
25..	55.27	26.6	29.8	24.2	87.2	22.5	SW	2.5	9.2	Ci.-S.		N.	SW	0.2 a. p.
26..	56.97	27.3	31.5	24	80.2	21.5	W	2.2	7.3	A.-Cu.	NW	Variable	SW	0.2 a. p.
27..	56.40	26.1	31	23	86.8	21.8	Variable	1.3	8	Ci.-S.		Cu., N.	SW	83.6
28..	53.74	24.7	26	23.5	92.7	21.4	SW	1.7	10	Ci.-S.		N.	SW	50.7
29..	51.11	25.4	27	23.6	92.7	22.2	SW	4.3	10	Ci.-S.		N.	SW	6.8
30..	53.99	26.3	28.4	24.1	88	22.4	SW	4	10	Ci.-S.		N.	SW	0.2 a. p.
31..	55.88	26.6	29.6	24.4	88.2	22.8	SSW	2.2	9.2	Ci.-S.		S.-Cu.	SW	0.2 a. p.
Mean	755.90	26.6	30.5	23.8	86.5	22.3		2.1	8.5					
Total														417.4

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1..	758.71	28.3	32.7	23.9	83.3	23.6	NE	152.5	2.7	Ci.		Cu.	E	7.4	☉ d° a. p. ☽ ↙ p.
2..	59.55	28.3	33.6	24.6	84.2	23.7	NE	135.1	6.8	Ci.		Cu.	E	10.9	☉ a. p. ☽ ↙ d p.
3..	59.52	27.8	33	24	85.5	23.5	NE quad.	145.8	5.3	Ci., Ci.-S.		Cu.	E	3	☉ d° ↙ p.
4..	58.91	26.6	31.2	23.5	89.5	23.1	NE	107.6	10	Ci.-S.		Cu.	E	78.5	☉ d° ↙ a.
5..	58.21	28.2	33	24.3	84	23.6	NE	126.1	4.2	Ci.		Cu.	E	30	☉ a. ☽ ↙ p.
6..	58.44	27.2	31	24	87.2	23.2	E	96.5	7.8	Ci.-S.		Cu.	E	2.3	☉ d° a. ☽ ↙ p.
7..	58.11	28	33.5	23.7	85.3	23.7	E	134.3	2	Ci.		Cu.	E	8	☉ d° a. ☽ ↙ p.
8..	57.88	27.5	32.8	24	85.5	23.2	Variable	110.9	5.8	Ci., Ci.-S.		Cu.	SW	7.1	☉ a. ☽ ↙ p.
9..	57.27	27.8	32.6	24	84	23.1	SW	142.4	4.7	Ci.		Cu.	W, SW	10.9	☉ a. d ↙ p.
10..	57.12	27.2	32.6	24.1	87.5	23.3	Variable	128.7	4.8	Ci.		Cu.	SW	10.9	☉ a. ☽ ↙ p.
11..	57.29	27.2	32.6	24	85.5	23.4	SW, ESE	121.6	7.2	Ci.-S.		Cu.	W, ESE	2.5	☉ a. p. ☽ ↙ p.
12..	58.19	27.2	31.5	24.1	86.3	23.3	Variable	117.2	6.5	Ci., Ci.-S.		Cu.	SW	18.5	☉ a. ☽ ↙ p.
13..	57.87	27.8	32.4	24	84.5	23.3	NE	114.9	5.7	Ci., Ci.-S.		Cu.	E, NW	49.8	☉ a. p. ☽ ↙ p.
14..	55.22	27.6	31.7	25	88	24	Variable	217	10	Ci.-S.		S.-Cu.	NE	122.4	☉ a. p. ☽ ↙ p.
15..	50.63	26.4	28.2	24.5	90.5	23.3	N quad.	355.7	10	Ci.-S.		S.-Cu.	NNE	69.4	☉ a. ☽ ↙ p.
16..	51.11	25.3	26.3	23.9	90.7	21.7	SW	452.3	10	Ci.-S.		Cu., N.	SW	0.2	☉ a.
17..	53.99	27.4	30.6	25	82.3	22.2	SW	308.7	10	Ci.-S.		Cu.	SW	0.2	☉ a.
18..	54.73	28.1	32	25.6	79.2	22.2	SW	303.4	10	Ci.-S.		Cu.	SW	0.2	☉ a.
19..	54.77	28.6	33.3	25.1	78.5	22.7	SW	267.3	8.5	Ci.-S.		Cu.	SW	0.2	☉ a.
20..	55.64	28.1	31.8	25.4	78.2	22	SW	316	9	Ci.-S.		Cu.	SW	0.2	☉ a.
21..	55.82	26.5	32.8	22.9	84.2	21.5	SW	337.9	9	Ci.-S.		Cu.	SW	5.8	☉ a. ☽ ↙ p.
22..	54.42	27.3	31.8	24	82.2	22	SW	396.4	9.7	Ci.-S.		Cu.	SW	12.4	☉ p.
23..	53.29	27.5	32.2	23.5	82.3	22.1	SW	221.6	10	Ci.-S.		Cu.	SW	0.2	☉ p.
24..	53.83	27.3	31.8	24.6	83	22.3	SW	220.3	10	Ci.-S.		Cu.	SW	0.2	☉ p.
25..	55.56	28.5	33.3	25	78.2	22.4	SW	220.9	9	Ci.-S.		Cu.	SW	0.2	☉ p.
26..	56.89	28.2	32.8	24.9	80.5	22.5	SW	173.8	7.8	A.-Cu.	NE	Cu.	SW	0.2	☉ p.
27..	55.95	27.2	31.8	23.9	81.5	21.6	WSW, SW	218.9	9	A.-Cu.	NNE	Cu.	SW	15.8	☉ p.
28..	52.66	24.8	26.4	23.5	93	21.6	SW	384.6	10	Ci.-S.		S.-Cu.	SW	9.9	☉ a. p.
29..	51.05	26.2	29.3	24	82.8	20.9	SW	453.9	10	Ci.-S.		Cu.	SW	1.1	☉ a. d a. p.
30..	54.40	28	30.8	25.8	78.8	22.2	SW	296.7	9	Ci.-S.		Cu.	SW	0.8	☉ a.
31..	55.98	27	32.3	24.8	86.8	22.9	SW	183.9	5.5	Ci.		Cu.	SW	1.8	☉ ↙ p.
Mean	755.90	27.4	31.7	24.3	84.3	22.7		224.6	7.7						
Total								6,962.9						458.9	

\* This is an approximate height of the barometer above sea level.

## Meteorological data for first and second class stations—Continued.

## SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied,  $-1.69$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean)	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	758.53	27.8	33.9	23.2	85.5	23.5	N. SW	1.8	3.8	Ci.		Cu.	S	0.2 a. $\nabla$ $\angle$ p.
2.	59.46	27	33.4	23	86	22.5	ESE	1.5	6.8	Ci.-S.	E	Cu.-N.	SE	0.2 a. $\nabla$ $\angle$ p.
3.	59.38	28.1	34.8	22.7	81.5	22.5	N	1.7	3.7	Ci.	E	Cu.-N.	NE	0.2 a. $\nabla$ $\angle$ p.
4.	58.89	27.9	32.4	22.6	80.8	22.2	N. ESE	1.5	5.2	Ci.	E	Cu.-N., Cu. Equad.		0.3 d. a. $\nabla$ $\angle$ p.
5.	58.11	28.4	34.2	24	79.7	22.4	ESE	1.5	5	Ci.	ENE	Cu.-N.	ESE, N	0.5 d. a. $\nabla$ $\angle$ p.
6.	58.07	27.8	33.3	23.4	80.8	22	SE	1.7	4.7	Ci.		Cu.-N.	E, ESE	1.8 d. a. $\nabla$ $\angle$ p.
7.	57.99	27.9	32.5	22.5	79.8	21.9	ESE	2.2	4.2	Ci.		Cu.-N.	ESE	0.3 d. a. $\nabla$ $\angle$ p.
8.	57.84	28.7	34.4	23.5	79.8	22.8	Variable	1.8	5.5	Ci.		Cu.	S	0.3 d. a. $\nabla$ $\angle$ p.
9.	57.56	27	34	21.7	87.2	22.8	S	2	6.7	Ci.-S., Ci.		Cu.-N.	WSW	31.2 d. a. $\nabla$ $\angle$ p.
10.	57.36	27.2	31.4	22.8	86.3	23	S	2.8	6	Ci.		Cu.-N.	S	0.2 a. $\nabla$ $\angle$ p.
11.	57.32	27.3	33.1	24.2	86.2	22.8	S	1.8	6.5	Ci.-S., Ci.		Cu.-N.	SE	0.2 a. $\nabla$ $\angle$ p.
12.	58.49	26.9	32.8	23.9	90.3	23.6	S	2.2	7.2	Ci.-S.		Cu.-N.	SE, SW	0.2 a. $\nabla$ $\angle$ p.
13.	58.32	26.2	32.5	23.3	88.7	22.3	NE	2.2	8	Ci.-S.		Variable	E	0.2 a. $\nabla$ $\angle$ p.
14.	55.95	26.8	33.3	23.2	89.5	23	N	2	7.8	Ci.-S.	ESE	Cu.	N quad.	0.2 a. $\nabla$ $\angle$ p.
15.	52.97	25.8	31.5	23.3	94.2	23.3	N	1.3	9.7	Ci.-S.		N.	NNE	52.4 d. a. $\nabla$ $\angle$ p.
16.	52.34	25.8	31.2	23	93	22.9	SW, N	1.8	9.3	Ci.-S.		N.	WSW	23.4 d. a. $\nabla$ $\angle$ p.
17.	53.96	26.2	30.4	24.1	89.3	22.4	SSW	2.7	8.7	Ci.-S.		N.	SW	1.8 d. a. $\nabla$ $\angle$ p.
18.	54.78	26.5	30.6	23.6	88.8	22.8	SW	2.7	9.2	Ci.-S.		Cu.-N.	WSW	1.8 d. a. $\nabla$ $\angle$ p.
19.	54.93	26.5	30.6	23.9	93	23.8	SW	2.7	9.7	Ci.-S.		Cu.-N.	SW	12.1 d. a. $\nabla$ $\angle$ p.
20.	56.66	24.4	25.5	23.6	98.3	22.4	SW, S	2	10	Ci.-S.		N.	SW	24.2 d. a. $\nabla$ $\angle$ p.
21.	56.42	24.8	28.6	23.3	94.8	22	S	2.5	8.5	Ci.-S.		N.	S	4.1 d. a. $\nabla$ $\angle$ p.
22.	55.21	25	29.5	22.9	94.5	22.2	SSW	2	8.3	Ci.-S.		N.	SW	7.1 d. a. $\nabla$ $\angle$ p.
23.	53.45	26.1	29.6	23.3	90.3	22.6	SSW	3	6.3	Ci.		Cu.	SW quad.	0.2 a. $\nabla$ $\angle$ p.
24.	53.57	26	28.9	23.8	91.8	22.8	SSW	3.8	9.3	Ci.-S.		N.	SW	7.7 d. a. $\nabla$ $\angle$ p.
25.	55.41	25.8	28.5	23.8	92.8	23	SSW, S	4.3	9.7	Ci.-S.		N.	SW	10.3 d. a. $\nabla$ $\angle$ p.
26.	57.15	26.4	30.6	22.8	88.8	22.6	SSW	3.3	8	Ci.-S.		N.	SSW	0.2 a. $\nabla$ $\angle$ p.
27.	56.81	25.9	30.6	23.5	91.2	22.4	S	2.2	7.8	Ci.-S., Ci.		Cu.	SW	10.7 d. a. $\nabla$ $\angle$ p.
28.	53.68	24.7	27.9	23.1	96.2	22.2	W quad.	1.3	10	Ci.-S.		N.	W	19.5 d. a. $\nabla$ $\angle$ p.
29.	49.90	24.1	24.9	22.7	98.5	22	SSW	4	10	Ci.-S.		N.	SW	57.8 d. a. $\nabla$ $\angle$ p.
30.	53.63	25.2	28.6	22.5	94	22.4	S	4.7	9.3	Ci.-S.		N.	SW	7.4 d. a. $\nabla$ $\angle$ p.
31.	56.14	25.2	27.9	23.8	96.5	23.1	S	2.8	10	Ci.-S.		N.	SSW	18.5 d. a. $\nabla$ $\angle$ p.
Mean	756.14	26.4	31	23.3	89.3	22.7		2.4	7.6					
Total													324.7	

## DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied,  $-1.67$  mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	757.75	29.8	36.3	24.5	73.5	22.5	N quad.	234.6	5.5	Ci.	S.-Cu., Cu.			☐ a. ☐ ∟ p.	
2.	58.59	28.8	35.7	24	75.3	22	SE quad.	192.6	5.8	Ci.-S.	Cu.			☐ p.	
3.	58.71	28.5	34.3	23.9	76.7	21.7	SE	181.1	5.3	Ci.-S.	Cu.			☐ a. ☐ d° p.	
4.	57.98	29.2	37.3	23.5	74.2	22	SE, NW	181.7	4.5	Ci.-S.	Cu.			☐ d° p.	
5.	57.37	28.4	35.8	24.8	79.5	22.6	Variable	188.5	5	Variable	Cu.		7.9	☐ a. ☐ p.	
6.	57.15	28.6	36.6	24.5	79.3	22.6	SE	233.8	7.5	A.-Cu.	S.-Cu.	E	8	☐ a. ☐ p.	
7.	57.17	28.2	37.2	24.1	79.2	21.8	SE quad.	223.9	3.7	Ci.	Cu.		25.4	☐ a. ☐ p.	
8.	57.25	28.9	35.8	24	79.5	23.3	NW	237.3	5.3	Ci.	S.-Cu.			☐ a. ☐ p.	
9.	56.92	29	32.9	25.5	77.8	23	NW	194.7	7.5	Ci.	S.-Cu., Fr.-N.			☐ a. ☐ d p.	
10.	56.63	27.9	34.6	24.5	82.8	23	W quad.	234.7	8.8	Ci.	Cu.-N.	SW		☐ d° a. d p.	
11.	56.70	27.8	33.6	24.2	82.8	22.9	S, NW	181.7	8.8	Ci.-S.	Cu.-N.	SE	2.5	☐ p.	
12.	57.68	27.1	33.1	24	83.8	22	SE	166.4	7.5	Ci.	Cu.-N.	SE	5.6	☐ p.	
13.	57.73	26.5	33.3	23	84.3	21.4	SE quad.	174.1	7.3	Ci.	Cu., N.		26.4	☐ a. ☐ p.	
14.	55.43	27.4	32.3	22.6	81.5	21.9	NW	232.4	7.8	Ci.-S.	Cu.			☐ a. ☐ p.	
15.	52.20	27.6	32.7	24.6	84.7	23.2	Variable	171.3	8.8	A.-Cu.	Fr.-N.	E	3.6	☐ a. ☐ p.	
16.	51.38	26.1	31.6	24.2	91.8	23	SE	141.7	9.2	A.-Cu.	N.	N	24.7	☐ a. ☐ p.	
17.	53.12	27.6	31.9	24.4	80	21.7	Variable	164.2	10	Ci.-S., A.-S.	Fr.-N.	SW		☐ a. ☐ p.	
18.	53.92	26.7	31.2	24	84.8	21.9	Variable	155.3	9.3	A.-S.	Fr.-N.	SW	4.1	☐ a. d p.	
19.	53.97	26.8	29.9	24.5	88.3	23.1	Variable	146.1	10	A.-S.	N.	SSW, SW	38.9	d° a. ☐ p.	
20.	55.56	24.5	25.9	23.5	95.7	21.8	SE	199.4	10	A.-S.	N.	SSE	61.5	☐ a. ☐ p.	
21.	55.50	25.2	29.1	23.5	91.2	21.7	SE	182.1	9.8	A.-S.	Fr.-N.	E, SW	12.5	☐ a. ☐ p.	
22.	54.32	25.6	31.4	23.5	89.5	21.8	SE	159.6	9.5	A.-Cu.	Fr.-N.	SW	6.9	☐ a. ☐ p.	
23.	52.44	25.8	32.8	23.1	89.3	22	SE	188.4	9.3	A.-S.	Fr.-Cu.	SSE	27.2	☐ a. ☐ p.	
24.	52.28	25.2	29.9	23.6	92.5	22	SE	205.2	9.3	A.-S.	Fr.-N.	SE, E	23.6	☐ a. ☐ p.	
25.	54.25	25.6	29.1	23.5	93.2	22.7	SE	231.6	10	A.-S.	N.	SE	16	☐ a. ☐ p.	
26.	56.26	26.4	32.8	23.4	88.5	22.5	SE	229.6	9.7	A.-Cu.	Fr.-N.		6.4	☐ a. ☐ p.	
27.	55.89	26.6	33.3	23.5	86.3	22.2	SE	178.6	8.8	Variable	N.	W	16.6	☐ a. ☐ p.	
28.	52.76	25.1	28.9	23.1	93.2	22.1	W quad.	222.4	10	A.-S.	N.	NW	79.2	d° a. ☐ a. p.	
29.	47.94	24.4	26.2	22	91.5	20.8	SW	399	10	A.-S.	N.	SW	176.4	☐ a. ☐ p.	
30.	52.24	25	27.7	22	93.7	22	SE	220.6	10	Ci.-S., A.-S.	Fr.-N.	SW	26.5	☐ a. ☐ p.	
31.	55.01	26.2	28.9	23.6	91	23	SE	200.1	9.8	A.-S.	N.	SE	16	☐ a. ☐ p.	
Mean	755.23	27	32.3	23.8	85	22.3		201.7	8.2						
Total								6,252.7					608.7		

a From the 25th, the minimum temperatures of this station seem to be too low by about  $1^{\circ} C$ .

## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.	Upper.	Lower.	
1.	758.11	29.1	33.1	23.9	77.2	22.8	Variable	3	9.2	Ci.-S.	Cu., S.-Cu.	mm.
2.	58.75	27.6	34.1	24.1	83.2	22.5	SE, S	2.5	10	Ci.-S.	Cu., Cu.-N.	12.4
3.	59	28.2	33.1	23	81.7	23.1	SE quad.	2.7	9.8	Ci.-S.	Cu.	3
4.	58.28	29	34.7	24.9	81.2	23.9	SE quad.	2.5	5.5	Ci.-S.	Cu. SSE	3
5.	57.50	28.8	34.1	24.5	82.3	23.9	SSE	2.2	10	Ci.-S.	Cu.-N.	3
6.	57.25	27.8	34.1	25.4	86.8	24	SE	2.3	10	Ci.-S.	S.-Cu.	16.8
7.	57.39	27.8	33.5	23.1	85.3	23.4	Variable	2.3	9.8	Ci.-S.	Cu. ESE	38.6
8.	57.49	27.4	32.7	23.2	85.5	23	SSE, S	2.5	10	Ci.-S.	Cu. S	2.3
9.	57.14	27.8	31.7	24.5	86.3	23.9	S, W	1.8	10	Ci.-S.	Cu.-N.	3.6
10.	56.77	26.9	30.6	24.7	88	23.1	SE quad.	2.2	10	Ci.-S.	Cu.-N.	5.9
11.	56.78	26.8	31.5	24.1	86.3	22.5	SE, W	3	10	Ci.-S.	S.-Cu.	14.8
12.	57.91	26.3	31.1	23.9	88.8	22.5	S	3	10	Ci.-S.	Cu. S	1.1
13.	57.79	27	32	23.4	85	22.3	S quad.	2	10	Ci.-S.	Cu. SW, W	8.9
14.	55.75	27.8	32.7	23.1	83.7	23	SSE, N	2	10	Ci.-S.	Cu. NW	2.5
15.	52.36	29.2	33.2	26	82.8	24.9	N quad.	2.2	10	Ci.-S.	Cu. NNE, NW	62.7
16.	51.46	27.3	32.9	24.3	90.2	24.3	W quad.	3.3	10	Ci.-S.	Cu.-N.	44.7
17.	53.24	26.9	30.8	24.3	86.5	22.8	SW quad.	3.7	10	Ci.-S.	Cu. SW	47.4
18.	54.10	25.6	29.5	23.5	93	22.7	S quad.	2.7	10	Ci.-S.	N., N.-cf.	58.2
19.	53.92	26.1	28.4	24.2	94.5	23.6	S quad.	3	10	-----	N.-cf.	109.2
20.	55.25	24.5	25.5	23.4	96.7	22	SSE	3.5	10	Ci.-S.	Cu.-N.	19.1
21.	55.36	25.3	27.4	23.5	92	22	S	4.2	10	Ci.-S.	N.-cf., S.-Cu.	68.6
22.	54.22	25	28.5	23.5	93.8	22	S quad.	3	10	Ci.-S., A.-Cu.	N.	25.7
23.	52.68	25.9	30.7	23.4	90.3	22.4	SSE, ssw	2	9.8	Ci.-S., A.-Cu.	Cu. NW	27
24.	52.06	24.8	26.6	23.6	94.7	22	S	3.8	10	A.-Cu.	N.-cf., N.	28.6
25.	53.87	24.8	26.1	23.6	96	22.3	SSE	4.2	10	Ci.-S.	N.-cf.	9
26.	56	26.1	30.5	23.9	91.2	22.8	S	3.3	10	A.-Cu.	N.-cf. sw, ssw	5.1
27.	55.93	26.2	29.5	24.1	89.3	22.6	SSE	3.5	10	Ci.-S.	N.-cf.	163.8
28.	53.13	24.9	26	23.9	95.8	22.4	SW quad.	2.5	10	Ci.-S.	N.-cf.	240
29.	47.32	24.2	25.2	23.3	-----	-----	W, SW	8.8	10	-----	N.	30
30.	51.37	25.8	29.6	23.8	94	23.2	SW	4.7	10	-----	N.-cf.	18
31.	54.88	25.8	28.7	24.2	93.3	23	SSW	4	10	-----	Cu.-N.	-----
Mean	755.26	26.7	30.6	23.9	88.5	23	-----	3.1	9.8	-----	-----	1,064.3
Total	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

## BAGUIO.\*

[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	636.76	19.2	24.5	15.8	78.8	13	Variable	306.5	5.3	Ci. NE	Cu.-N. SE	30.5
2.	37.28	18.6	25.4	16.1	82	13	E quad.	264.4	8.3	Ci. E	Cu.-N. SE	4.6
3.	37.59	18.9	24.2	15.5	80.8	13.2	Variable	291.3	7.9	Ci. ENE	Cu.-N. ENE, S	14.2
4.	36.97	18.8	23.3	16.1	86.8	14.1	Variable	279.3	6.3	Ci. S	Cu.-N. S	1.3
5.	36.43	19.3	23.7	16.7	87.7	14.6	Variable	190.9	7.7	Ci. S	Cu.-N. SE	7.3
6.	36.21	19.6	26.4	17	87.5	14.7	E, SE	243.5	7.9	Ci.-S.	S.-Cu. NE	6.6
7.	36.16	19.4	25.4	15.8	88.3	14.7	Variable	332.9	6.1	Ci. ENE	Cu.-N. WSW	3.8
8.	36.15	19.1	24.5	16.1	89.7	14.6	ESE, W	355.4	7.1	Ci.-S.	Cu.-N.	3.1
9.	35.79	18	24.9	15.8	95.8	14.8	WSW	254.2	8.1	Ci.-S.	Cu.-N. SSW	3.6
10.	35.19	18.4	23.4	16.3	90.8	14.3	Variable	191.2	7.6	Ci.-S.	Cu.-N. S, SE	7.2
11.	35.26	18.4	23.5	16.1	92.3	14.4	E	198	9.4	A.-Cu., Ci.-S.	Cu. SE	12.7
12.	36.02	17.8	23.3	15.5	94.8	14.3	E quad.	261.3	7.4	Ci.-S.	Cu.-N. SE, SE, S	53.9
13.	36.02	18.4	23.5	16.5	91.8	14.4	E quad.	-----	8.9	Ci.-S.	Cu.-N.	1.3
14.	34.45	18.4	23.1	15.8	91.8	14.6	Variable	-----	6.6	Ci.-S. SWbyS	Cu. ENE	16.5
15.	32.02	19.1	24	16.8	91.2	15	NE	-----	9.6	Variable	Cu.-N. NE quad.	10.2
16.	31.07	18.6	24.1	16.7	93.2	14.9	W quad.	262.1	8.3	Ci.-S.	Cu.-N.	12.2
17.	32.25	17.9	20.5	16.5	97.2	14.9	WSW	389.8	10	-----	N.	13.4
18.	32.83	17.6	21.8	16	96	14.4	WSW	475.5	10	Ci.-S.	Cu.-N. WSW	101.6
19.	33.02	17.2	18.5	16.4	97.2	14.2	WSW	558.5	10	-----	N.	8.2
20.	34.04	17.5	19.7	16.4	97.2	14.5	WSW, SW	374.3	10	-----	N.	28.2
21.	34.02	16.8	20	15.7	97.2	13.8	WSW	441	9.9	A.-Cu.	N. WSW	20.7
22.	32.91	17	19.2	16	99.2	14.3	WSW	441.9	10	-----	N.	48.7
23.	31.51	17.8	22	15.7	95.7	14.6	SW quad.	257.2	9.9	-----	Cu.-N. ENE	19.1
24.	31.26	17.4	19.8	15.4	93.2	13.7	SW quad.	297.7	9.4	Ci. SbyE	N. SW quad.	20.4
25.	33.04	17.3	20	16.5	94.8	13.9	S quad.	476.6	10	-----	N. SW	7.6
26.	34.96	17.8	20.4	16.5	94.8	14.2	WSW, SW	411	10	A.-Cu.	Cu.-N. SW	23.1
27.	34.60	18	21.9	16.1	94.8	14.6	WSW	443.6	9.7	Ci.-S.	Cu.-N. SW	204.7
28.	31.62	17	17.7	15.8	98.7	14.2	NW quad.	613.7	10	-----	N.	807.3
29.	25.63	b16.7	-----	-----	b98.2	b14	W quad.	-----	10	-----	N.	94.9
30.	30.55	b17	17.6?	15.8?	b98.5	b14.2	WSW, SW	-----	10	-----	N.	33.4
31.	33.82	17.4	21	16.3	97.7	14.4	WSW, SW	-----	9.7	A.-Cu.	Cu.-N. WSW	-----
Mean	634.05	18.1	22.2	16.1	92.7	14.3	-----	356.5	8.7	-----	-----	1,620.3
Total	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

\*The barometric readings of this station are not reduced to sea level.

b Mean deduced from four observations only.



**VIGAN.**

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. et.	mm.		Km.	0-10.					mm.	
1.	758.27	28.5	33.2	24.8	74.5	21.3	SE quad.	169.3	3.0	A-Cu.	SW	Cu.		5.1	☐ 3° p p.
2.	58.92	27.3	32.7	24.8	78.3	21	ESE	157.6	3.8	Cl.	NNE	S.-Cu.		1	☐ 3 a. p. d p.
3.	58.12	28	32.3	24.3	82.3	23	Variable	151.6	4.2	Cl.-S.		Cu.	NNE	11.9	☐ 3° p.
4.	58.32	28.2	33.4	25.3	78	21.9	ESE	148.8	4	Cl.-S.		Cu.	NNE	2.3	☐ 3 d p.
5.	57.66	27.9	32.6	24.3	81.2	22.5	S quad.	148.4	2.7	Cl.-S.		Cu.	NE		
6.	57.39	27.7	32.2	25	85.2	23.3	SE, SSW	174.5	5.5	Cl.-S.		Cu.-N.	SSW		
7.	57.47	28.3	32.2	25.1	80.7	22.9	Variable	175	4.5	Cl.-S.		Cu.	NNE		
8.	57.51	28.1	33.7	25.1	83	23.2	Variable	116.7	5	Cl.-S.		Cu.	SW		
9.	57.18	27.8	31.4	25.3	80.5	22.8	S quad.	178.6	3.8	Cl.-S.		Cu.	SW	19.3	
10.	56.88	26.2	31.1	23	87.2	22	SE	203.3	7	Cl.-S.	NE	Cu.-N.	SSW	9.4	☐ 32° 2 a. ☐ 3° p
11.	56.96	27	31.5	22.8	81.6	21.5	SE	185.8	6.3	Cl.-S.	NE	Cu.	SW	31.8	☐ 3° p.
12.	57.82	26.2	30.7	24	85.7	21.5	SE quad.		7.7	Cl.-S.	NE	Cu.-N.	SW	13.2	d ● p.
13.	57.84	27.4	31.8	24.2	81.7	22	SE	149.6	5.5	Cl.-S.		Cu.	SSW	1.5	d ● p.
14.	56.83	27.3	31.7	24.3	85.8	23	NW quad.	111.6	5.7	Cl.-S.		Cu.	N	1.3	☐ 3 d ● p.
15.	52.28	28.2	33.3	24.3	80.5	22.7	Variable	97.5	5.2	Cl.-S.	S	Cu.	N	43.4	☐ 3° a. ☐ 3° p.
16.	51.30	27.5	31.7	25.3	87.3	23.7	Variable	94.2	7.8	Cl.-S.		Cu.-N.	NE, S	173.3	☐ 3° a. ☐ 3° p.
17.	53.08	25.4	28.4	23.4	93.8	22.5	SSE	228	9.7	Cl.-S.		N.	SE, SW	51.3	☐ 3° 2 a. ● d p.
18.	53.84	26	29.5	22.6	89.7	22.4	SSW	328.1	9.8	Cl.-S.		N.	SSW	86	d ● a. p.
19.	53.67	26	29.7	24.5	90	22.5	SSE	323.3	10	Cl.-S.		N.	SSW	5.1	☐ 3° a. p.
20.	54.51	27	29.2	23.2	83.7	22.1	SSE	522.1	10	Cl.-S.		Cu.-N.	SSW	9.2	☐ 3° a. p.
21.	55.02	26.7	29.8	23.8	83.3	21.6	SSE	345.1	9.5	A-Cu.		S.-Cu.	SSW	24.4	☐ 3° a. p.
22.	54.30	26	29.4	23.1	88	21.9	SW	245.9	9	Cl.-S.		N.	SSW	24.1	☐ 3° a. p.
23.	52.31	26.1	29.7	23.5	88.7	22.2	SSE	210.9	5.3	Cl.-S.		Cu.-N.	S	1	☐ 3° a. p.
24.	51.86	26.7	29.8	23.8	82.3	21.2	SSE	364.5	8	A-Cu.	E	cu, cu.-N., ssw		7.2	☐ 3° a. p.
25.	53.63	26.9	29.8	25.2	82.7	21.8	SSE	354	9.5	A-Cu.	SSW, S	Cu.-N.	S	9.1	☐ 3° a. p.
26.	55.89	28.4	30.7	25.2	75.7	21.7	SSE	352.1	8	A-Cu.	SW	Cu.-N.	SSW	478.9	☐ 3° a. p.
27.	55.97	27.1	30.5	25.4	80.8	21.6	SSE	109.3	7.3	A-Cu.	sw, wsw	Cu.	SW	222.7	☐ 3° a. p.
28.	52.72	25.7	27.6	23.7	90	22	Variable		8.8	Cl.-S.		N.	NNW	95	☐ 32° a. ● 2 a. ● p.
29.	41.90	25.8	27.4	24.4	95.5	23.6	W quad.		10	A-Cu.		N.	NNW	5.7	☐ 32° a. ● 2 a. ● p.
30.	50.06	25.7	27.5	22.4	91.8	22.5	SSE		10	Cl.-S.		N.	SSW		
31.	54.46	26.5	30.9	24.6	89.2	22.9	SSE		9	A-Cu.		N.	SSW		
Mean	754.97	27	30.8	24.2	84.5	22.3		217.1	7						
Total														1,333.2	

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ : barometer above sea, 23 meters: gravity correction not applied,  $-1.61$  mm.]

[illegible]

## Meteorological data for first and second class stations—Continued.

## APARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied, -1.57 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	758.42	28.7	33.5	24.6	76.7	22.2	Variable	264.3	2	Cl., A.-Cu. E, W	Cu.	S	—	⊥ ∠ p.
2.	59.03	28.4	33.1	24.3	76.8	21.9	SW quad.	255.5	3.2	Cl.-S.	W	E	—	⊥ p.
3.	59.24	28.7	33.6	24.4	77	22.4	S	287.4	2.5	Cl.	E	S	—	○ a. ∠ p.
4.	58.58	29	33.4	24.8	77.7	23	SW	323.8	2	Cl.-S.	E	S.-Cu.	—	—
5.	58.12	28.7	32.5	24.4	80	23.3	E	242.6	2.8	Cl.-S.	E	Cu.	—	—
6.	57.70	29.4	33.7	24.4	77.3	23.3	Variable	211.2	.8	Cl.-S.	E	Cu.	1.3	⊥ a. ⊥ ● p.
7.	57.37	29.3	34.5	25.1	76.8	23.1	NE, S	356.3	4	Cl.	E	Cu.-N.	—	⊥ a. ∠ p.
8.	57.61	28.8	33.5	25.5	80.2	23.3	Variable	290.4	6.5	Cl.	E	Cu.-N.	NE	⊥ a. ∠ p.
9.	56.81	28.8	33.1	24.8	78	22.7	N quad.	243.2	7.5	Cl.-S.	SW	Cu.-N.	—	⊥ ∠ p.
10.	56.53	27.4	33.9	24	83.2	22.4	Variable	263.9	7.2	Cl.-S.	NE, E	Cu.-N.	S	1.3
11.	56.75	27.8	33.5	23.6	79.7	22	SW, S	287.1	7.5	Cl.-S.	E	S.-Cu.	ENE	⊥ a. ∠ ⊥ p.
12.	57.74	28.5	33	24.1	76.7	22	Variable	248.5	8.5	A.-Cu.	E	S.-Cu.	—	⊥ p.
13.	57.76	27.6	32.4	23.5	82.5	22.6	Variable	278.8	5	Cl.-S.	E	Cu.-N.	—	⊥ p.
14.	55.89	28.6	33.2	24.5	79.7	23.2	SW	288.2	3.3	Cl.-S.	S	Cu.-N.	SE	⊥ a. ∠ ⊥ p.
15.	53.13	29.4	33.6	25.6	79.5	24.1	E	257.4	6.2	A.-Cu.	W	Cu.-N.	E	1.3
16.	51.84	27.4	31.1	23.5	85.7	23.2	N quad.	255.3	9.8	Cl.-S.	E	Cu.-N.	E	38.5
17.	51.81	27.2	31.1	24.6	83.2	22.2	W quad.	391.6	10	Cl.-S.	SW	S.-Cu.	—	● a.
18.	51.90	28.6	33.6	24.5	76.8	22.4	S	409.8	10	Cl.-S.	SW	S.-Cu.	—	—
19.	51.86	29.1	33.9	25.6	70.3	20.9	SW	572.5	10	Cl.-S.	SW	Cu.-N.	W	—
20.	52.98	29.4	34	26.2	69.5	21	SW	479.8	10	Cl.-S.	W	S.-Cu.	W	—
21.	54	28	33.4	24.6	77.7	21.6	SW	299.8	10	Cl.-S.	W	S.-Cu.	W	2.5
22.	53.50	27.3	32.8	24.1	84.3	22.6	S quad.	287	7.2	A.-Cu.	W	Cu.-N.	ENE	4.1
23.	52.34	27.3	32.1	24.1	84.3	22.6	Variable	207	4.5	Cl.-S.	E	Cu.-N.	ENE	—
24.	51.72	27.3	33.5	24.2	84.7	22.6	Variable	263.7	4.5	Cl.-S.	E	Cu.	S	4.6
25.	53.89	26.6	33	23	85	21.8	S quad.	276.6	7.8	A.-Cu.	S	cu., Cu.-N. s, sw	—	24.5
26.	56	27.6	32.4	22.6	81.5	22.2	NE, S	224.1	5	Cl.-S.	SW	S.-Cu.	—	⊥ p.
27.	55.59	27.5	32.7	24.1	85	23.1	S	263.5	7.5	Cl.-S.	E	s.-Cu., cu.-N. NE	—	1
28.	51.09	25.4	28.5	23.5	92.5	22.4	SW, NW	583.2	9.2	Cl.-S.	E	N.	NNW	89.7
29.	41.40	25.5	28.9	23	86.2	21	SE, S	1,050.7	10	-----	-----	N.	NE, S	49.6
30.	49.09	26	30	22.6	82.5	20.6	S	513.2	10	Cl.-S.	-----	S.-Cu.	S	—
31.	54.23	27.6	33.5	24.4	82.7	22.6	S	268.8	7.5	A.-Cu.	S	S.-Cu.	W	—
Mean	754.64	28	32.7	24.3	80.4	22.4	-----	336.9	6.5	-----	-----	-----	-----	-----
Total	-----	-----	-----	-----	-----	-----	-----	10,445.2	-----	-----	-----	-----	218.4	-----

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, JULY, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan	10.4	9.7		7.7	5.6		13.5	.3							20.1	
Zamboanga				57.7	6.9		4.1		24.9		3.3		25.9	10.7	28.2	3
Davao			18.3	5.8	13.2			2.5	11.7		2.8		55.9	20.9	35.3	14.5
Cotabato	8.1	.3	2.5	50.8	28.4	.3		2	1.5			3.6	8.1	84.1	14.3	27.9
Cagayan, Misamis	3	29.2	1.5		10.4	8.6		3.3	.8	24.4			8.6	14.8	7.4	.8
Butuan		4.1	.3	.3	32	1.5							64	7.9	.3	14.5
Dumaguete			3.8	1.3	33.8	.8					8.1	.8		31.5	28.6	3.7
Yap, W. Carolines	4.6	30.2	10.7	36.1	14.7	1.8		1.3	1.5		9.9	14.7	20			2
Maasin			10.2					54.6	53.3				48.8	127.1	18.3	
San José Buenavista	2.5	15		1.3	9.9	37.3	19		88.1	4.6	3.3	14.8	7.9	119.1	8.1	29.2
Cuyo	18.3	2.5	1.6		7.6	1.8	12.9		54.6	2.3	3.1	1.3	1.8	134.6	1.5	22.3
Guiuan	2.8	11.2	11.4		46.8	1.8	21.3	13.2			37.3		18	143		.3
Borongan	1	6.9	23.4	7.3			.5	5.1	48.5			7.4	22.9	64.2	2.5	
Masbate						1	34.8	7.9	4.1	22.1			26.9	2.8	40.7	116.6
Romblon		.3	3.6	35.1	1.5	13.3							15	16.8	66	65.8
Batag			8.3		32.8	2.3								82.2	56.1	
Gubat		1.8	15.5	2.5	8.6	7.4		10.9				8.1		115.8	82.3	12.2
Sumay, Guam			3.2	5.7	3.2	3.2		19.7		26	4.4		29.8	.6	16.5	.6
Calapan	9.7	9.9	7.9	40.1	21.3	8.1	3.7							34	21.3	39.6
Virac	1		8.9	1.5	44.7	3.8		15.2	5.6	2		.3	4.3	42.7	171	16.8
Nueva Caceres			6	.1	9.9			27.4		11.2	1.7	1.8	4.3	75	1387	19.67
Batangas	2.8	.5	47.7	2	18.8	5.6	.5			11.7	1.8	.8		32.7	40.1	16.2
Silang					35.6			25.7	14.2		7.9	23.3	2	53.6	68.3	61.2
Santa Cruz, Laguna	2	.3	1	4.6	2	.3		18.4	5.8				2	13.5	42.7	47.7
Antipolo	12.2		21.8		21.9	2	.8	4.6	.5	6.4	18.3	30.7	34.8	18.8	29.7	
Iba	.3	6.6	3.7		1.1		14.5	28.4	10.8	7.9	39.5	6	8.7	.4	27.5	250.3
Tarlac			1.8		18			2	42.2	1		.8	1.8	.8	16.5	7.4
Baler		16.3		2	12.2	7.6		20.1	.5			2.9	4.8	26.2	7.9	2.3
San Fernando, Union					17			10.2	3.6	3.8	56.9	10.4	10.4	11.7		
Echagüe	8.9				1	4.6		1		3	1				2.1	25.4
Candon								2	16.3	16.8	25.9	23.4	4.8	10.4	1.3	3.3
Laoag						30.7	1	.3		13.2	54.6	27.7	.5			.3
Santo Domingo, Batanes	12.7	6.4	.2						2.2			9.7			9.1	6.4

Station.	Day of month.															
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	Total.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan						7.4						5.6				81.5
Zamboanga						6.9						12.4				184
Davao		6.6	2.8			10.9						8.6				173
Cotabato	.3				9.4	34	.3	10.7	.3	2.5	27.4	16			8.1	340.9
Cagayan, Misamis						41.1	1.8	3.3			5.1	10.9				175
Butuan						13.2		5.8		3.6	.5	12				162.7
Dumaguete					1	14.9	3.9	2.8		12.7	6.3					154
Yap, W. Carolines	1	22.4		3.8	.8	43.4	11.2	102.6	69.3	5.8	.8		.6	1.3	17.6	428.6
Maasin						17.3		27.4			31	29.5				417.5
San José Buenavista	35.3	43.7	.3	9.4	23.6	71.4	175.3	25.4	7.4	3	36.8	8.9	.6	19.6	16.3	837.1
Cuyo		49.2	7.8		40.1	48.8	134.3		8.1	1.8	38.9	5.6	11.9	9.4	1.3	623.4
Guiuan						.5	.5			.5	1.3					311.5
Borongan						1.5	.3	1			20.1	3.6				273.4
Masbate		9.4			1	1					23.9	22.1				395.3
Romblon	10.1	10.4	37.6	8.1	16	5.4	9.4	51.4	1.8		12.2	53.3	23.6	15	2.1	521.4
Batag											20.6	4.3				226.4
Gubat		15.5			14.7	7.4				33.8	9.4	4.3				350.2
Sumay, Guam		4.5				2.5	1.9	1.9	3.2	.6		2.5	20.3	23.5	5.1	178.9
Calapan	4.8	1	11.4	.6	38.4	1.3	.8	11.7	.8		5.3	56.4	41.1	2	.5	371.7
Virac											24.9	22.6	6.9	.8		373
Nueva Caceres	14.8	1.7			36.1	4.8	.1	1.5			14.6	13.5	14.1	5.7		401.9
Batangas	19.8	6.3	20.6	10.4	74.4	4.3		10.6	1.3		11.7	70.8	73.1	2.8	3.6	490.9
Silang	41.4	25.9	16.5	51.1	37.1	6.1	24.9	9.4	1		50.8	69.8	23.7	14.5	25.9	695.9
Santa Cruz, Laguna	17.6	15.5	16.3	3	10.6	2.3	.3	1.8	.3		3.3	88.4	22.8	2	3.3	387.8
Antipolo	18	48.3	64	48.2	69.6	84.3	39.7	5.6	4.5	1.5	45.5	72.4	27.7	26.9	20.1	778.9
Iba	23.8	27.6	147.1	233.9	87	58.6	48.2	46.4	113.1	8.9	77	92.7	152.1	100	35.4	1,657.5
Tarlac	3	33.1	14	56.9	16.3	26.7	16	31.8	28	6.3	39.3	22.3	85.1	8.4	15.2	494.7
Baler		.3				6.6	.1	.8	.5			22.1	15	1.3		149.5
San Fernando, Union	33.7	75.2	68.9	6.9	7.4	24.4	31.5	4	6.8	2	2	121.9	300.5	18.5	8.6	836.3
Echagüe	.5					47			.3	.8	50.8	54.1	43.2			243.7
Candon	58.1	25.2	45.2	3.8	5.1	16	43.7		1		1.3	266.1	779.3	74.1	5.6	1,427.4
Laoag		.6	19.8		8.6	4.8	3.2	13	.3			142.8	76.7	108.2	.5	506.8
Santo Domingo, Batanes	43.9	9.8	12.3	4.3	.5		1.5	1	11.7	8.5	4.1	34.1	18.2	10		206.6

Maximum and minimum temperatures for third-class and rain stations, July, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Butuan.		Dumaguete.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1.	29.5	22	30.1	22.1	29.5	22.9	32.7	21.8	34.6	22.9	32.8	22.5	29.7	23.5	32.2	24
2.	31.8	21.8	31.1	22.3	30.5	23.5	32.2	21.7	32.2	21.7	31.7	21.5	31.6	23.6	31.1	24
3.	32.6	22.1	31.1	23.1	30.6	23.5	32.5	21.8	32.1	21.8	30.1	22	29.3	23	31.6	23.6
4.	31.5	22.6	30.1	22.1	29.9	23.6	31.8	22	32.6	22.7	31.5	22.2	30.2	23.6	30.5	24
5.	29.5	22.3	29.1	22.1	29.4	23	29.7	22.3	30.8	21.5	31.8	22.2	29.8	23.6	30.3	23.8
6.	30.8	22.2	29.6	22.8	29.6	23.1	30.5	21.9	29.7	22.2	30.7	22.5	31	23.3	30	22.8
7.	29.4	21.8	30.6	21.8	29.6	22.8	32.7	22.5	31.7	22.8	31.5	21.7	31.1	23.9	32.5	21.8
8.	33.5	22.1	31.6	21.5	30.2	23	32.5	21.5	31.8	22.2	32.1	22.7	30.5	23.4	31.3	23.2
9.	28.7	22.7	29.6	22.6	29.1	23.8	30.7	22	30.7	23.2	31.2	23	30.6	23.5	31.7	24.3
10.	32.1	21.4	30.3	21.4	30.6	22	30.7	21.8	31.3	22.3	29.8	22	29.5	23.3	31.3	24.3
11.	32.2	22.2	28.1	22.9	27.6	23.5	32.5	21.9	31.5	22.6	31.4	21.7	31.5	23.2	31.6	22.3
12.	32.1	21.7	30.2	21.9	30.4	22.4	32.7	21.1	33.6	23	31.8	22.5	31.5	24.1	31.5	22
13.	30.6	22.4	30.3	22.1	32.2	23.3	27.2	21.5	30.2	22.7	31.4	23	28.5	24.1	31.5	22.7
14.	30.3	23.7	29.1	22.7	27.4	23.4	30.7	23	25.2	22.6	26	24	25	23.1	29.6	24.3
15.	30.9	23.5	31.1	23.1	28.5	21.4	30.7	22	27.8	21.7	30.5	22.8	28	23.2	27.6	22.6
16.	30.8	22.1	29.1	22.3	27.9	24.9	31.7	22.6	27.7	21.7	30.3	22.8	29.6	23.2	31	22.9
17.	32.8	24.3	31.1	23.6	30.9	24.8	31.2	21.9	31.9	21.4	33.8	23	30.7	22.8	31	22.5
18.	31.8	24.9	31.8	21.6	31	24	32.2	23.5	32	23.1	33.7	22.9	32.6	24.5	33.6	26.1
19.	33.8	24.6	32.2	22.1	30.4	23.2	32.7	21.5	31.8	22.7	33.8	21.8	32.2	23.2	33.7	24.9
20.	34.6	24.8	32.6	23.1	31.5	23.5	31.7	21.9	32.7	23	33.9	23.8	32.7	24.9	33.7	22.1
21.	33.7	23.7	32.4	22.1	30.5	23.7	32.1	22.3	32.4	22.6	32.9	22	32.1	24.6	35	23
22.	33.5	24.2	31.6	22.3	31	23.4	31.2	23.4	30.8	22	34	22.6	30.6	23.9	30.2	23.8
23.	33.6	23.2	31.6	22.6	29.9	22.5	30	23.3	29.8	21.7	32.2	22.5	31.5	23.3	29.5	23.5
24.	33.7	24.6	31.9	22.8	30.6	24.7	32.1	21.9	30.9	22.8	34.5	22.8	31.6	23.5	30.1	23
25.	33.9	24.7	32.6	22.6	31.1	23.4	29.2	21.3	31.7	21.6	32	22.2	28.6	23.5	32.5	22.5
26.	32.4	24.3	32.1	22.3	31.3	24	30.7	22.5	31.5	23.2	30.9	23.1	28.6	23.8	31.8	23.1
27.	33.6	22.8	31.4	22.5	29.9	25	30.7	22.3	29.3	23.6	30	23	28.6	23.4	29.8	23.9
28.	31.9	23.8	32.1	23.1	29.6	26.3	31.2	22.3	29.9	21.3	30.5	22.2	29.8	23.6	30.6	22.8
29.	33	22.8	31.6	21.9	29.6	23.6	32	22.5	31	21.9	32.5	22.3	30.3	22.9	31.1	24
30.	34.2	25.1	32.1	22.3	31.5	24.4	32.4	23.9	33.2	22.5	35	23.4	32.2	23.7	32.5	26.6
31.	34.9	25	32.6	22.6	30.6	24.1	32.2	22.6	31.8	22.6	34.2	22.3	32.5	23.9	33.8	22.9
Mean	32.2	23.2	31	22.4	30.1	23.6	31.4	22.2	31.1	22.4	31.9	22.5	30.4	23.6	31.4	23.5

Day.	Yap, Western Carolines.		Maasin.		San José Buenavista.		Cuyo.		Guiuan.		Borongan.		Masbate.		Romblon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1.	33.9	26.1	33	24.2	23.4	29	24.2	32.2	24.3	31.7	22.9	32	27	33	24.9	
2.	28.7	23.5	33.2	24.4	24	30.4	23.9	32.2	24.3	31.3	22.9	34.4	26	34	23.7	
3.	33.1	23.6	33	24.4	22.1	32.8	23.9	32.2	23.3	31.9	23.4	32.5	26.4	34.5	23.8	
4.	31.8	24.5	33.2	24.1	23.4	31	25	31.4	24.3	31.2	22.7	33.4	26.5	30.5	22.4	
5.	32.7	23.6	31.5	24.6	22.6	31.8	24.4	31.7	24.8	31.5	22.7	31	26.5	33.8	23.7	
6.	32	24	32.2	23.8	24.1	30.1	25	32.7	24.3	31.3	23.4	33.2	25	34	24.1	
7.	32.4	25	32.6	23.8	23.4	27.4	24.4	32.2	23.5	32.1	22.3	34	25	34	23.4	
8.	31.9	25.4	31.6	23.8	22.4	32.5	23.8	31.3	22.8	31.1	23.4	34	25	34.2	23.4	
9.	32.1	24.5	31.7	22.4	24	31.4	25.4	31.8	23	33.1	22.2	33.8	25.2	35.2	25.2	
10.	32.5	24	30.9	22.4	22.6	27.4	23	30.6	26.6	31.9	22	29.5	23.5	33.7	25.6	
11.	33.3	24	34	22.3	22.2	27.4	23.3	30.7	24.8	33.1	24	32	25.5	32.6	24.7	
12.	29.6	24.7	34.1	22.3	23	30.7	23.8	31.9	23.4	31.8	23.2	29.6	26	32.9	23.7	
13.	29.8	23.4	30.7	24.3	23.5	31.4	24.9	31.9	23.3	32.3	23.2	32.6	25.2	34.2	24.3	
14.	31	23.1	30.2	22.8	23.6	28	24.9	32.2	24	29.1	23.2	24.2	23.8	24.6	23.6	
15.	32.2	24	30.5	22.8	23.5	27.8	23.4	28.7	24.2	27.3	22.9	24	29.6	23.2	23.2	
16.	33.7	24	30.6	22.6	25	29.9	22.4	28.7	24.3	30.9	24.7	24.5	29.2	23.5	23.5	
17.	31.9	23.9	30.6	22.6	24.5	31.7	24	29.2	25.9	32.8	22.8	30.5	24.5	34.3	23.4	
18.	32.7	25.3	32.5	22.6	23.5	32.1	23.8	30.2	28	33.8	21.3	32.8	27	31.7	23.1	
19.	32.2	23.2	32.4	24	24	32.2	24.1	31.3	28	33.5	20.5	33.2	26.5	33	23.2	
20.	32.3	24.9	32.5	24.2	26.5	32.7	26.4	32	28.1	34.7	22.3	33.6	26.2	34.3	22.2	
21.	32.3	23.4	32.3	24.2	24	32.8	26.8	30.9	28	33.7	22.3	33.5	26.6	32.4	23.7	
22.	28.3	23.4	31.2	24	22.6	29.9	23.7	32.2	28.2	33	21.4	31.6	26.4	34.7	22.8	
23.	29.7	25.5	31	24.1	23	26.7	22.8	31.9	24.3	33.3	22.4	30.2	26.4	34.3	23.9	
24.	29.3	22.5	30	23.2	22.2	30.7	22.6	31.2	26.1	32.9	23	29.8	25.5	30.6	23.1	
25.	29.2	22.8	31.5	23.3	23.5	31.6	23.6	30.2	27.1	34	22.6	31.5	25.5	33.9	21.9	
26.	30	23.3	31.5	23.2	23	31.7	24	30.3	27	31.3	23	31.6	26	33.8	23.4	
27.	31	23.9	29.5	23.1	24.7	30.4	26.4	30.2	26.6	28.3	24.6	31.8	27.4	33.1	26	
28.	30.7	24.8	29.5	23	22.6	27.7	23.3	28.1	26.1	28.8	22.8	32.5	25.2	28.8	23	
29.	32.7	24.1	29.7	23	25.2	28.4	26.3	29.5	26.6	32.3	21.5	31.4	25	29.8	22.8	
30.	32	24.5	31	22.8	25.3	31	25.6	30.5	28	33.3	23.9	30.6	27	34.6	23.1	
31.	30.3	23.2	31	22.8	23	32.7	24.1	31.6	27.9	33.8	23.4	32.4	26.6	35	23.8	
Mean	31.5	24.1	31.6	23.4	23.6	30.4	24.3	31	25.5	32	22.7	32.1	25.7	33	23.7	

Maximum and minimum temperatures for third-class and rain stations, July, 1913—Continued.

Day.	Batag.		Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	31.9	23.5	33.2	24	31.9	25.8	32.5	23.2	33.2	23.2	35	21	35.8	23.2	30.6	20.3
2	32	23.5	32.7	23.9	32.3	26.2	32	23	32.7	23.7	34	22.3	32.8	24.7	30.8	20.8
3	32.4	23.1	32.3	23.6	31.7	25.9	33.6	23	33.4	23.4	33.5	22	34.2	24	30.5	20.1
4	30	23	31.2	24.6	31.1	25.4	26	22.5	32.3	23	31.6	22	30	23.2	30.9	20.5
5	32.4	23.6	32.2	24.4	31.7	24.4	32.5	22.6	30.5	23	34	21.7	33.8	22.6	31.3	20.9
6	30.9	22.8	31.1	23.9	31.7	24.8	31	22	32.4	23	31.4	22.8	32.3	22.7	31.7	19.2
7	31.5	23	33.2	23.5	31.9	23.5	31.2	23	32.6	23	33	21.5	32.4	23.5	29.6	19.6
8	31.4	23	33.8	23.6	30.4	25.5	32.1	22.8	33	23	33.7	22	32.4	23.2	31.5	20.4
9	31	22.4	33.7	23.6	30.9	24.2	32.5	22.8	32.8	23	33.2	21	32.8	24.4	32.2	20
10	30.5	23	32.6	24.9	29.8	24.5	30.4	22.5	31	23	33.1	22.4	31.2	24.6	29.9	19.2
11	31	22.6	33	24.4	30.4	22.9	31.1	22.5	31.4	23	32.7	23.4	32.1	23.7	29.6	19.6
12	31	23	34.3	24.6	30.7	24.4	33.6	21.8	30	23	32.9	22.6	31.3	24.4	28.2	19
13	31.9	23	32.7	24.4	31.2	25.4	33.7	21.4	30.5	23	33.5	21.8	32.3	23.2	28	19.8
14	29.5	23	30.3	25	30.1	24.2	31	23.1	30.1	23	28.9	22.9	32.1	23.8	30	19.1
15	25	21.6	26.7	24	30.2	24.2	30.7	23.7	23	23	29.5	23	27.3	24.1	30.2	18.7
16	27	21.5	28.2	23.8	29.4	23.2	23	23	23	23	26.6	21.9	28.3	23.6	27	18.1
17	29.4	23.4	32.5	24.3	30.2	24	27	23.5	30.1	23	30.6	23.7	27.6	23.5	26.4	18
18	31.4	23.2	33.4	24.9	30.2	25.8	30.5	22.5	32.5	23	31	23.1	29.5	24.3	27.5	18.6
19	31.4	23.4	32.7	24.9	30.4	25.8	31	23	32.4	23	31.7	23.1?	30.4	25	28	18.1
20	30.9	23.9	32.5	25.5	31	26.3	31.6	23.8	32	23	31.5	23.5	28.3?	23.3	27.2	18
21	31	23.6	32.1	25.5	30.8	26.9	30.4	22.7	32.1	23	31.7	24	29.1	23.5	27	18
22	30.9	23.4	30.5	24.3	30.4	25.2	32.1	22	31.4	23	32.1	22.2	30.3?	23.2	26.9	18.2
23	30.5	23.1	31.2	24.9	29.4?	24.7	31.4	22.8	31.2	23	31.4	22	31.1	25	27.5	18
24	29.2	23	30	25.3	32.2	24.7	25.8	23.1	29.5	23	30.2	24.7	27.4	24.4	27.2	17.4
25	31.5	22.9	32.4	24.4	30.4	25.9	30.9	22.6	32.5	23	32.2	23.4	30.8	23.4	26.9	17.8
26	29.6	22.8	33	24.2	31	25.5	31.2	23.3	31.8	23	33	23.5	32	24.5	29.2	18.6
27	29.5	24.5	31.6	26	32	24.7	34	22.5	29.3	23	32.8	23.5	31.2	23	30	18.2
28	27	21.9	27.8	23.8	30.5	24.4	27.6	23.2	27.5	23	26.8	22.7	26.9	23.2	30.5	18.1
29	29.4	21.6	31.7	23.9	30.4	24.2	26.7	22	28.3	23	29	21 ?	27	23	26.7	17.6
30	31	23	33	25.4	29.5	23.3	30.5	22.4	30.5	23	30.5	20.7?	29.3	23.6	26	17
31	31	22.9	34	25.5	30.4	24.1	32.2	23	32	23	31.9	23.4	29.2	24	26.2	18.9
Mean	30.4	23	31.9	24.5	30.8	24.8	30.9	22.8	31.3	23	31.7	22.5	30.7	23.7	28.8	18.9

Day.	Sta. Cruz, Laguna.		Antipolo.		Iba.		Tarlac.		Baler.		San Fernando, Union.		Echague.		Candon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	34.2	23.4	34.2	22.8	32.5	22.5	35.5	22.6	32.9	23.3	33	22.4	36.9	23	31.4	24.7
2	34	24.1	32.1	23.2	32.4	21.7	31.7	22.5	30	23.4	33.4	23	33.4	24	31.4	25
3	33.5	23.6	32.8	22.7	32.5	22	35.2	23.4	32.4	21.8	33.2	22.7	35.8	21.9	31.9	24.5
4	31.5	23.6	30	22.3	32.5	22.5	34.4	21.4	31.7	22.5	33.4	22.8	35.1	21.8	32	25.9
5	33.3	23.1	32	22.5	32.8	23.5	36	23	31.9	23.5	33.7	22.4	36.4	23.5	31.9	25
6	32.1	23.1	31.8	21.8	34.1	23	32.7	23.4	30.6	24.1	31.6	24.7	33	24.2	31.7	25.8
7	33.6	24.6	33.1	22.2	33.3	23.2	34	23.4	32.1	22.1	34	22.6	36.7	22.4	31.8	25.1
8	33	22	32.4	22.3	31.6	23	34	23.6	34.7	22.9	30.1	23.1	37.8	21.9	31.9	25.6
9	33.2	24	31.6	23.6	31.5	22.5	36	24	34.4	23.8	32.2	24.5	36.1	23.5	30.9	24.9
10	33.2	23.5	29.9	22.7	30	23.8	36	23.4	33.9	23.7	31.5	23.3	36.3	23.4	29.9	25.5
11	32.9	23.6	31.8	22.7	31.2	23.5	34	23.5	32.9	23.8	31.2	23.7	36.3	23	30.7	24
12	30.5	22.6	28.6	22.6	30.7	23.1	32.7	23	33.9	23.2	32.6	23.4	36.3	23.2	30.6	24.5
13	32.9	22.7	32	22.7	31.7	22.9	35	23.2	33.7	23.9	32.7	23.1	35.6	23	30.4	24.1
14	31.6	23.5	30.1	21.8	31.8	22.2	35.5	22.6	33.9	23.5	31.2	22.9	36.1	23.7	30.6	24
15	31.8	23.5	25.9	23	33	22.7	35.1	23.8	30.8	24.2	32.5	23.5	33.9	24.2	30.9	24.5
16	27	23.1	25.7	22.7	27.5	23.9	31.6	23	32.4	23.9	33.2	25	30.5	24.3	30.9	25.5
17	27	23.5	26.4	21.9	30	22.5	30.7	23.2	32.3	25	30.9	24.6	33.4	23.7	29.6	26.2
18	30.3	23.5	27.8	22.7	28.9	23	29.5	23.4	33	24.3	28.9	23.5	34.4	22.2	29.4	24.2
19	31.8	24.2	29.9	22.3	31	24	30	22.7	33.7	25.5	25.8	23.9	35.3	23	26.2	25
20	31.9	24.2	25.7	22.7	26.2	23	31	22	30.9	25.4	27.3	23.9	35.1	22.6	28.6	25
21	29.5	23.8	25.4	21.3	26.4	22	30.1	22.5	31.7	25.4	25.4	24.4	36.9	23.3	27.4	25.9
22	29.1	23.8	28	21.6	26.7	22.6	29.7	22.5	34.4	25	30	23.8	36.7	23.3	30	25.2
23	30.6	23.2	27.8	22.3	26.9	23.1	30.2	22.5	33.4	23.7	31.3	23.3	34.3	23.9	29.6	25.1
24	30.8	23	27.3	22.5	28	23.1	28.7	22.3	34	22.1	27.7	23.5	34	23.6	29	24.5
25	30.8	24.2	28.1	22.6	27	23.5	29.3	23.4	33	24	27.1	24.6	34.5	23.8	29.4	25.6
26	31.2	23.9	29.3	22.4	30.8	23	30.7	23.2	33.6	23.7	31.7	24.6	34.4	23.4	31.2	26
27	31.8	23.8	28.4	22.9	31.5	24	27.5	23	35	24.7	32.4	24.3	34.2	23.8	29.9	25.9
28	29.8	23.2	25.8	21.5	26.5	23	27.5	23.2	30.4	24.4	27.5	24.2	24.3?	22.3	27.9	25
29	29.5	23.2	25.5	21.3	27.4	23.9	24	22.6	28	23.2	24.9	22.9	25.8	22.5	25.5	23.6
30	31.7	23.9	27.2	22.6	29.6	23	28	21.8	30.5	23.2	26.7	22.8	31.4	22.6	27.3	23.6
31	31	23.5	27.4	22.3	29.6	23.5	28	24	32.3	23.8	29.3	24.2	34.6	22.7	29.9	25
Mean	31.5	23.5	29.2	22.4	30.2	23	31.8	23	32.5	23.8	30.5	23.6	34.4	23.2	30	25

*Maximum and minimum temperatures for third-class and rain stations, July, 1913—Continued.*

Day.	Laoag.		Sto. Domingo, Batanes.		Day.	Laoag.		Sto. Domingo, Batanes.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.		°C.	°C.	°C.	°C.
1.....	33.7	23.3	32.3	24.7	18.....	31.2	24.7	29.6	24.5
2.....	33.5	23.5	32.5	23.8	19.....	29.3	24.2	29.4	24.1
3.....	32.8	24.2	33	24.5	20.....	30.5	24.8	29.6	23.9
4.....	33.2	24.2	33.2	25	21.....	30.6	25.9	30	25
5.....	33.1	23.7	33.3	24.1	22.....	31.4	23.9	32.6	26
6.....	33.7	23.9	33.3	24.8	23.....	31.5	23.1	32.5	24.1
7.....	32.4	24.2	33.5	25.5	24.....	32.4	24.1	32.5	26
8.....	32.7	24.5	32.7	26	25.....	31.7	23.8	32.7	24.6
9.....	32.9	24.2	32.5	26.4	26.....	32.5	24.5	32.8	23.9
10.....	32.9	24.5	32.7	26.4	27.....	32.3	24.7	32.2	24.2
11.....	32.3	22.5	32	24.5	28.....	28.3	23.6	30.5	25.1
12.....	31.2	23.2	33	24.6	29.....	28	21.1	29.6	24.2
13.....	30.9	23.5	33.3	24.3	30.....	27.9	19.5?	29.8	24.6
14.....	32.3	23.9	32	24.5	31.....	30.9	23.2	31.9	23.8
15.....	35.2	23.5	33.4	23.9					
16.....	35.8	25.7	32.7	26.1					
17.....	30.8	24.2	31.4	24.4					
					Mean.....	31.9	23.8	32	24.8

# SEISMOLOGICAL BULLETIN FOR JULY, 1913.

By Rev. MIGUEL SADERRA MASÓ, S. J.,  
*Assistant Director of the Weather Bureau.*

## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

2, 12<sup>h</sup> 36<sup>m</sup> 34<sup>s</sup> \*[2, 20<sup>h</sup> 36<sup>m</sup> 34<sup>s</sup>]. SE of Luzon. Earthquake of intensity III-IV, felt in the N parts of the Province of Sorsogon and in the east of Albay. The epicenter was probably the same as that of the November, 1912 earthquakes.

3, 5<sup>h</sup> 00<sup>m</sup> [3, 13<sup>h</sup> 00<sup>m</sup>]. Surigao (NE of Mindanao). Subsultory earthquake intensity III and duration about 4 seconds.

9, 11<sup>h</sup> 50<sup>m</sup> [9, 19<sup>h</sup> 50<sup>m</sup>]. Santo Domingo (Batanes Islands). A single subsultory shock, accompanied by subterranean noises.

11, 10<sup>h</sup> 43<sup>m</sup> 22<sup>s</sup> \*[11, 18<sup>h</sup> 43<sup>m</sup> 22<sup>s</sup>]. Batangas (S Luzon). Earthquake of intensity III, accompanied by subterranean noises. Its origin was in the sea to the E of Isla Verde Passage.

12, 1<sup>h</sup> 27<sup>m</sup> [12, 9<sup>h</sup> 27<sup>m</sup>]. Santo Domingo (Batanes Islands). Earthquake of intensity II-III, duration 2 seconds.

20, 1<sup>h</sup> 15<sup>s</sup> [20, 10<sup>h</sup> 15<sup>m</sup>]. Yap (Western Carolines). Oscillatory earthquake direction E-W, intensity III, duration 3 seconds. The shock was accompanied by subterranean noises which appeared to proceed from the east.

23, 12<sup>h</sup> 40<sup>m</sup> [23, 20<sup>h</sup> 40<sup>m</sup>]. Butuan (N Mindanao). Oscillatory earthquake direction SSW-NNE, intensity III, duration 4 seconds.

24, 10<sup>h</sup> 05<sup>m</sup> 31<sup>s</sup> \*[24, 18<sup>h</sup> 05<sup>m</sup> 31<sup>s</sup>]. Iba (W Luzon). Oscillatory earthquake, direction SW-NE, intensity III, duration 3 seconds. Its origin was in the China Sea, some 150 kilometers to the WNW of Manila.

26, 9<sup>h</sup> 24<sup>m</sup> [26, 17<sup>h</sup> 24<sup>m</sup>]. Aparri (NE of Luzon). Oscillatory earthquake direction E-W, intensity III, duration 2 seconds.

27, 2<sup>h</sup> 52<sup>m</sup> [27, 10<sup>h</sup> 52<sup>m</sup>]. Butuan (N Mindanao). Oscillatory earthquake direction SW-NE, intensity III-IV, duration 6 seconds.

29, 7<sup>h</sup> 06<sup>m</sup> [29, 15<sup>h</sup> 06<sup>m</sup>]. Tacloban (NE of Leyte). Earthquake of intensity II-III, small duration.

29, 22<sup>h</sup> 06<sup>m</sup> 45<sup>s</sup> \*[30, 6<sup>h</sup> 06<sup>m</sup> 45<sup>s</sup>]. Butuan (N of Mindanao). Earthquake of intensity IV, principal direction SE-NW, duration 10 seconds. Very probably the origin of the earthquake was in the Pacific not far from the eastern coast of Mindanao and in connection with the great Philippine Deep. It was registered by all the seismographs of the Far East, Europe, and North America.

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observers who sent the report. All time indications are in Greenwich mean time (Midnight=0<sup>h</sup>), Insular time being added in brackets for the convenience of Philippine readers.

## RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0h. Instrument: Wiechert seismograph: 1,000 kilograms.  $A_N$ :  $T_0=6.2$ ,  $\epsilon=2.21$ ,  $r=0.055$ ;  
 $A_E$ :  $T_0=6.4$ ,  $\epsilon=2.64$ ,  $\frac{r}{T_0^2}=0.034$ . Alluvium. 2.40 meters above sea level.]  $\frac{r}{T_0^2}$

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
230	2	Iv	eP F	h. m. s. 12 36 34 40				Southeastern Luzon.
231	6	IIr	eP eS iN eL M <sub>N</sub> M <sub>E1</sub> M <sub>E2</sub> F	16 16 53 20 03 20 54 22 48 24 00 26 10 27 26 17 24	9 11 13	67	112 111	
232	7	I	e F	9 27 14 10 00				
233	7	Id	iP F	9 49 39 52				
234	7	Ir	eP S L M <sub>E</sub> M <sub>N</sub> F	17 44 07 49 18 52 48 56 11 56 30 18 47	19 16	37 25		
235	8	Ir	eP eS eL M <sub>E</sub> M <sub>N</sub> F	22 15 25 20 06 24 00 26 04 26 36 23 11	7-8 11	37 21		
236	11	IIv	eP iL M <sub>N</sub> M <sub>E</sub> F	10 43 22 43 33 44 37 44 38 58	2-3 3-4	372 675		Batangas (S of Luzon).
237	12	IIr	e iS <sub>E</sub> eS <sub>N</sub> eL <sub>E</sub> eL <sub>N</sub> M <sub>E</sub> M <sub>N</sub> F	10 29 05 33 40 33 56 37 26 37 34 41 43 42 13 11 46	7-8 10 11 11	100 54		
238	13	Id	iP F	4 02 53 05				
239	13	Id	eP L M <sub>N</sub> M <sub>E</sub> F	7 59 55 8 00 15 00 21 00 21 06	1 1	174 192		
240	14	Id	eP L M <sub>E</sub> F	4 06 14 06 23 06 29 10	1	52		
241	14	Id	eP L M <sub>E</sub> F	6 00 58 01 10 01 13 04	1	58		
242	16	Id	eP F	7 56 51 59				
243	16	Id	eP F	8 06 29 12				
244	18	Id	eP L M <sub>E</sub> F	15 02 35 02 47 02 57 06	0.5	120		
245	21	Id	eP L F	6 02 00 02 09 04				



## Records of the microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
246	22	Ir	eP F	<i>h. m. s.</i> 6 41 40 7 12	----- ----- -----	----- ----- -----	----- ----- -----	Iba (W of Luzon).       E of Mindanao.
247	23	Id	eP L M <sub>E</sub> F	8 38 24 38 39 38 56 41	----- ----- 1 ----- -----	----- ----- 45 ----- -----	----- ----- ----- -----	
248	24	Iv	eP L M <sub>N</sub> F	10 05 31 05 47 05 58 10	----- ----- 0.5 ----- -----	----- ----- 228 ----- -----	----- ----- ----- -----	
249	29	Ir	eP S L M <sub>N</sub> F	22 06 45 10 13 12 06 12 48 23 03	----- ----- ----- 6 ----- -----	----- ----- ----- 158 ----- -----	----- ----- ----- ----- -----	
250	30	Id	eP F	13 11 16 14	----- -----	----- -----	----- -----	
251	30	Id	eP F	21 00 40 03	----- -----	----- -----	----- -----	

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

2, 12<sup>h</sup> 36<sup>m</sup> 34<sup>s</sup> \*[2, 20<sup>h</sup> 36<sup>m</sup> 34<sup>s</sup>]. **SE de Luzón.** Temblor de tierra de intensidad III-IV sentido en la parte N de la Provincia de Sorsogón y E de la de Albay. El epicentro probablemente era el mismo de los terremotos de Noviembre de 1912.

3, 5<sup>h</sup> 00<sup>m</sup> [3, 13<sup>h</sup> 00<sup>m</sup>]. **Surigao (NE de Mindanao).** Temblor de tierra susultorio, intensidad III, duración unos 4 segundos.

9, 11<sup>h</sup> 50<sup>m</sup> [9, 19<sup>h</sup> 50<sup>m</sup>]. **Santo Domingo (Islas Batanes).** Temblor de tierra susultorio momentáneo, acompañado de ruido subterráneo.

11, 10<sup>h</sup> 43<sup>m</sup> 22<sup>s</sup> \*[11, 18<sup>h</sup> 43<sup>m</sup> 22<sup>s</sup>]. **Batangas (S de Luzón).** Temblor de tierra de intensidad III, acompañado de ruido subterráneo. Su origen se hallaba en el mar hacia el E del paso de Isla Verde.

12, 1<sup>h</sup> 27<sup>m</sup> [12, 9<sup>h</sup> 27<sup>m</sup>]. **Santo Domingo (Islas Batanes).** Temblor de tierra de intensidad II-III, duración 2 segundos.

20, 1<sup>h</sup> 15<sup>m</sup> [20, 10<sup>h</sup> 15<sup>m</sup>]. **Yap (Carolinan Occidentales).** Temblor oscilatorio, dirección E-W, intensidad III, duración 3 segundos; acompañado de ruido subterráneo procedente al parecer del E.

23, 12<sup>h</sup> 40<sup>m</sup> [23, 20<sup>h</sup> 40<sup>m</sup>]. **Butuan (N de Mindanao).** Temblor oscilatorio, dirección SSW-NNE, intensidad III, duración 4 segundos.

24, 10<sup>h</sup> 05<sup>m</sup> 31<sup>s</sup> \*[24, 18<sup>h</sup> 05<sup>m</sup> 31<sup>s</sup>]. **Iba (W de Luzón).** Temblor oscilatorio, dirección SW-NE, intensidad III, duración 3 segundos. Su origen se hallaba en el Mar de la China a unos 150 kilómetros al WNW de Manila.

26, 9<sup>h</sup> 24<sup>m</sup> [26, 17<sup>h</sup> 24<sup>m</sup>]. **Aparri (NE de Luzón).** Temblor oscilatorio, dirección E-W, intensidad III, duración 2 segundos.

27, 2<sup>h</sup> 52<sup>m</sup> [27, 10<sup>h</sup> 52<sup>m</sup>]. **Butuan (N de Mindanao).** Temblor oscilatorio, dirección SW-NE, intensidad III-IV, duración 6 segundos.

29, 7<sup>h</sup> 06<sup>m</sup> [29, 15<sup>h</sup> 06<sup>m</sup>]. **Tacloban (NE de Leyte).** Temblor de tierra de intensidad II-III, duración cortísima.

29, 22<sup>h</sup> 06<sup>m</sup> 45<sup>s</sup> \*[30, 6<sup>h</sup> 06<sup>m</sup> 45<sup>s</sup>]. **Butuan (N de Mindanao).** Temblor de tierra de intensidad IV, dirección principal SE-NW, duración 10 segundos. Es muy probable que el origen de este temblor se hallaba en el Pacífico no lejos de las costas orientales de Mindanao, relacionado con la Gran Fosa. Registráronlo los seismógrafos todos del Extremo Oriente, Europa y América del Norte.

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (media-noche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.





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## BULLETIN FOR AUGUST, 1913.



# METEOROLOGICAL BULLETIN FOR AUGUST, 1913.

By Rev. JOSÉ CORONAS, S. J.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

Pressure and temperature.—The mean atmospheric pressure during the month was slightly greater than that during the same month of last year in almost all the stations in the Archipelago. The highest pressures were registered on the 17th, 18th, and 25th, the lowest on the 15th and 16th.

The mean monthly temperature scarcely differed from that of August, 1912, the greatest difference being  $+0.6^{\circ}$  C. in Aparri. The extreme temperatures in Manila were  $32.9^{\circ}$  C. on the 18th and  $22.3^{\circ}$  C. on the 30th.

### PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR AUGUST, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from August, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from August, 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		$^{\circ}$ C.	$^{\circ}$ C.	$^{\circ}$ C.		$^{\circ}$ C.	
Tagbilaran	757.80	+0.03	759.43	25	755.80	15	27.4	-0.1	33.5	15	21.9	19
Surigao	57.38	-.04	58.88	25	55.13	15	28	+.1	34.4	11	23.5	18
Cebu	57.58	+.18	59.22	25	55.22	15	27.7	+.4	33	14	22.5	19, 30
Iloilo	57.57	+.15	59.37	25	55.25	15	26.5	-.2	31.5	18	22	27, 28
Ormoc	57.75	+.03	59.46	25	55.02	15	27.1	+.1	31.6	9	21.9	29
Tacloban	57.18	+.02	58.88	17	54.44	15	27.1	-.4	34	4, 11	22.3	31
Capiz	57.39	+.18	59.30	25	54.81	15	26.3	-.3	34.1	3	22.6	7, 17
Calbayog	57.21	+.18	59	17	54.33	15	27.5	+.2	33.6	12	22.8	18, 19
Legaspi	56.73	+.13	58.95	17	53.32	15	26.9	+.3	33.9	18	22.6	14
Atimonan	56.37	+.16	58.98	15	52.98	15	26.7	0	34	10	22.3	22, 31
Ambulong, Tanauan	56.51		58.79	18	53.70	15	26.3		34	19	22.1	23
Paracale	56.45	+.23	59.22	18	52.63	15	27.1	0	34	12	22.7	30
Manila	56.93	+.28	59.26	18	53.97	15	26.3	-.1	32.9	18	22.3	30
San Isidro	56.82	+.21	59.30	18	53.46	16	26.1	-.2	34.1	18	22.3	8
Dagupan	55.88	-.18	58.66	18	51.99	16	26.8	0	34.4	20	22	16
Bolinao	55.95	+.26	59.07	18	51.22	16	26.4	0	33	18	22.1	16
Baguio <sup>a</sup>	634.50	+.24	637.25	18	629.78	16	17.6	-.2	24.2	20	12.8	16
Vigan <sup>b</sup>	755.78		759.13	18	748.60	16	27				22.3?	16?
Tuguegarao	55.85	+.30	59.81	18	47.50	16	27.2	-.1	36.2	11, 23	21.6	16
Aparri	55.49	+.33	59.99	18	44.43	16	27.6	+.6	33.6	11	22.6	16

<sup>a</sup> The barometric readings of this station are not reduced to sea level.

<sup>b</sup> 21 days of observation only.

Rainfall.—Comparing the total rainfall of this month with that of last August we find that with the exception of the stations in Mindanao, there is almost everywhere a negative difference; but comparing it with the normal for August there is an excess in the majority of stations, as may be seen from the following table.

In Manila the total rainfall was 349.1 mm. which is 307.5 mm. less than in August, 1912, and 9.9 mm. less than the normal.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF AUGUST, 1913.

Station.	Total.	Departure from August, 1912.	Departure from normal.	Rainy days.	Departure from August, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from August, 1912.	Departure from normal.	Rainy days.	Departure from August, 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.		mm.				mm.	mm.	mm.		mm.		
Jolo	137.2		- 23	13		53.1	25	Calapan	197.9	+ 28.8		19	- 1	66.6	5
Isabela, Basilan	176.1	+ 79.6		12	- 2	48.3	28	Virac	195.8	+ 56.8		12	- 12	103.9	19
Zamboanga	83.8	+ 44.2	- 6.5	10	+ 6	41.1	28	Nueva Caceres	244.2	+ 50	+ 86.4	19	- 2	40.4	1
Davao	191.2	+ 2.3	- 9.6	11	+ 2	90.2	15	Batangas	<sup>b</sup> 235.2						
Cotabato	302.4	+ 57.2	+ 37.4	23	+ 5	64.8	30	Atimonan	201.3	- 11.1	+ 40.7	16	- 2	63.5	31
Cagayan, Misamis	317.9	+ 105.3		20	+ 7	50.3	18	Ambulong, Tanauan	249.5			21		65	16
Butuan	193.7	+ 79.2	+ 94.8	13	- 2	55.6	20	Silang	187.7	- 441.7		15	- 4	49.3	4
Dumaguete	140.7	+ 67.8		15	+ 3	69.6	18	Paracale	259	+ 37.9		16	- 5	65.2	13
Yap, W. Carolines	442.1	+ 51		27	+ 7	90	12	Sta. Cruz, Laguna	329.9	- 48.8		27	+ 5	75.5	4
Tagbilaran	139.2	- 111.6	+ 16.7	8	+ 1	93	18	Manila	349.1	- 307.5	- 9.9	28	- 1	56.1	1
Surigao	73.6	- 5	- 16.8	11	- 5	31.8	20	Antipolo	573.7	- 74.7		28	0	61.7	19
Maasin	264.4	- 111.4	+ 55.2	11	- 3	47.8	12	Iba	1,025.9	- 334.3		30	+ 3	142.8	4
Cebu	83.2	- 145.6	- 63.6	15	- 1	26.4	18	San Isidro	342.3	- 171.3	+ 55.5	26	+ 1	73.6	19
Iloilo	556.8	+ 21.1	+ 224.6	23	- 1	101.6	5	Tarlac	358	- 90.2	+ 18.6	24	- 3	45.2	19
San Jose Buenavista	754.1	+ 34.2		30	+ 1	99.8	5	Baler	130.8	- 131.7		21	- 1	45.7	31
Cuyo	477.2	- 81.3		27	+ 1	77.3	24	Dagupan	467.6	- 73.7	+ 24.7	24	- 4	77.8	4
Ormoc	386.4	+ 43.2	+ 98.4	17	- 3	72.1	20	Bolinao	701.3	- 86.9	+ 166.7	27	- 3	111.7	11
Guiuan	<sup>a</sup> 53.6							Baguio	1,040.1	- 257.1	+ 12.2	28	- 3	166.6	16
Tacloban	158.6	- 24.3		21	+ 6	36.8	31	San Fernando, Union	582.9	- 464	- 78.8	27	- 3	120.9	16
Capiz	141.9	- 83.4	- 118.3	19	0	44.7	7	Echague	280.7	- 68.7		21	- 1	43.4	7
Borongan	159.5	+ 33.6	+ 40.2	17	- 2	54.4	20	Candon	567.6	- 442.1		22	- 8	143	15
Calbayog	101	- 131.2	- 87	16	- 7	18	24	Vigan	<sup>c</sup> 309.6						
Masbate	72	- 162.3		18	- 6	9.9	13	Tuguegarao	257.5	+ 50.1	+ 64.4	13	+ 2	80.5	5
Romblon	149	+ 39.6		22	+ 5	29	4	Laoag	332.5	- 286.5		17	- 6	146.5	16
Batag	126.9			11		71.1	19	Aparri	97.7	- 107	- 134.1	10	- 4	42.7	15
Gubat	188.3	+ 27.1		17	+ 2	53.3	19	Sto. Domingo, Bata-							
Legaspi	195.1	- 120.6	+ 18.4	23	0	34	1	nes	128.5	- 24.1		16	+ 1	48.2	15
Sumay, Guam	388.9	- 127.9		24	- 2	82.5	17								

<sup>a</sup> 28 days of observation.<sup>b</sup> 22 days of observation.<sup>c</sup> 21 days of observation.

## DEPRESSIONS AND TYPHOONS.

The Observatory had occasion to announce six typhoons during the month, though only one of them actually crossed the Islands, that, namely, of August 16, which passed over the Babuyan Islands close to the northern coast of Luzon. The tracks of these six typhoons are given in Plates IX and XI.

The typhoons of July 31 to August 9, 1913.—In the ordinary weather note of August 1, it was stated:

August 1, 11.40 a. m.: There are signs of a new depression or typhoon forming over the Pacific to the east of the Philippines. Another typhoon has appeared in the neighborhood of the northern part of the Ladrone Islands. The latter, however, will not be dangerous for the Philippines.

On the following day it was also noted that the first typhoon which had formed in the Pacific to the east of the Philippines would not be dangerous for the Islands:

August 2, 11.40 a. m.: The new typhoon mentioned yesterday morning remains very far off over the Pacific about half-way between the Western Carolines and the Loochoos, and is moving apparently northward. Hence it is not dangerous for the Philippines. The other typhoon of the Ladrone or Mariana Islands is probably recurving northeastward.

With regard to the Mariana typhoon the following was said in the weather note of the 3d:

August 3, 11 a. m.: The typhoon of the Ladrone Islands lies this morning to the SE of the Bonins, moving northeastward.

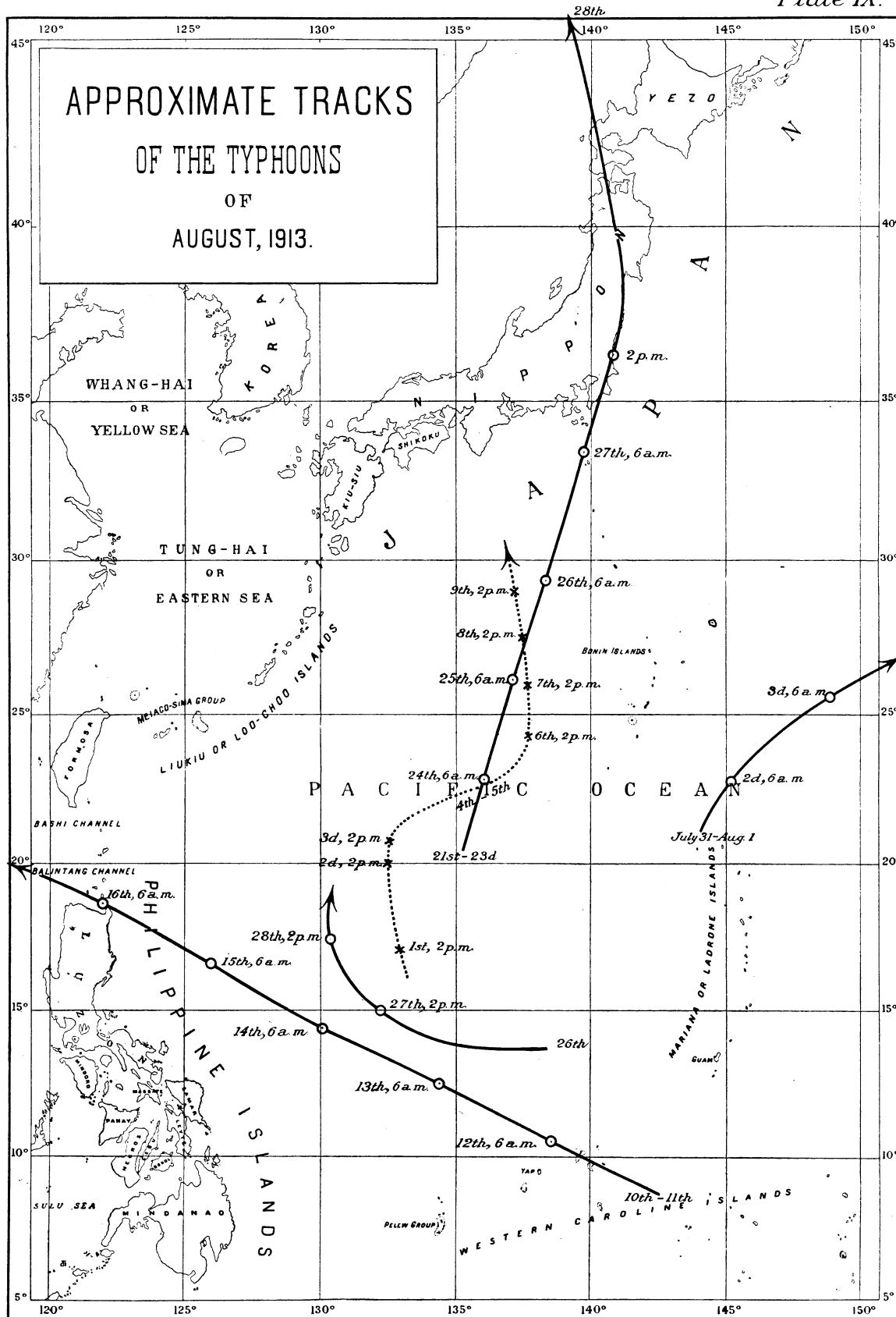
The track of the other typhoon was followed day by day in the weather notes of the 3d to 7th, thus:

August 3, 11 a. m.: The other typhoon of the Pacific was situated at 6 a. m. this morning to the NE of the Philippines in about 133° long. E and 20° lat. N, moving apparently to NNW.

August 4, 11.30 a. m.: The typhoon of the Pacific has been recurving northeastward since yesterday, its center being situated this morning to the SW of the Bonins in about 22° or 23° lat. N and between 135° and 137° long. E.



Plate IX.



August 5 and 6: The typhoon of the Pacific remains almost stationary to the SW of the Bonins.

August 7, 11.40 a. m.: The typhoon of the Pacific is situated to the WSW of the Bonins, moving apparently to NNE.

Over and above the observations which were made use of in writing these notes, we have also employed for the plotting of the tracks of these two typhoons the daily weather maps of Japan. Nevertheless the data thus obtained are not sufficient to give more than a probable value to these tracks.

The typhoon of August 10 to 18, 1913.—This typhoon belongs to the type of those that form in or near the Western Carolines, which thus allow ample time for their announcement before their arrival in the Philippines. Below is given a table of observations made in our station at Yap, Western Carolines, from the 10th to the 13th of the month. On them the Observatory based its first warning of the typhoon, which was sent to the meteorological centers of the Far East:

August 11, 4.50 p. m.: Typhoon near or over Western Carolines, direction unknown.

OBSERVATIONS MADE AT YAP, WESTERN CAROLINES, AUGUST 10 TO 13, 1913.

Date and hour.	Pres- sure.	Wind.		Weather.	Rain- fall.	Date and hour.	Pres- sure.	Wind.		Weather.	Rain- fall.
		Direc- tion.	Force.					Direc- tion.	Force.		
August 10:	<i>mm.</i>		0-12			August 12:	<i>mm.</i>		0-12		<i>mm.</i>
6 a. m.	757.90	Calm		o, d	<sup>a</sup> 5.6	7.30 a. m.	745.43	W	5	o, q, u	
2 p. m.	56.86	Calm		o	0.5	8 a. m.	45.66	SW	7	o, q, u	
August 11:						9 a. m.	46.78	SW	11	o, q, r	
6 a. m.	56.40	Calm		o		10 a. m.	49.48	SSW	11	o, q, r	
2 p. m.	53.88		1	o, r	<sup>b</sup> 29.5	11 a. m.	50.95	SSW	11	o, q, r	
6 p. m.	54.17	NW	1	o, q		Noon	51.41	SSW	10	o, q, d, r	
10 p. m.	54.27	NW	3	q		1 p. m.	50.81	SW	4	o, q, r	
August 12:						2 p. m.	50.16	SSW	6	o, d	<sup>b</sup> 89.7
1 a. m.	52.55	WNW	3	o, q		3 p. m.	49.73	SW	6	o, d	
2 a. m.	51.36	NW	4	o, q, u		4 p. m.	50.64	SSW	6	o, d	
3 a. m.	50.36	NW	4	o, q, u		7 p. m.	53.65	S	3	o	
4 a. m.	50.01	WNW	5	o, q, r, u		10 p. m.	55.22	S	3	o	
5 a. m.	50.33	NW	3	o, q, r, u		August 13:					
6 a. m.	47.29	NW	4	o, q, r, u	<sup>a</sup> 50.8	6 a. m.	55.61	Calm		o	0.3
7 a. m.	45.51	W	6	o, q, u		2 p. m.	55.70	S		o, r	5.1

<sup>a</sup> Rainfall from 2 p. m.

<sup>b</sup> Rainfall from 6 a. m.

The fall of the barometer was so pronounced at daybreak of the 12th in Yap, and the winds observed there were so decidedly from the NW and W, that there was not the slightest doubt that the typhoon would pass very close to the north of that station and that it was moving to the WNW. Hence the following typhoon warning was published in Manila in the morning of the 12th:

August 12, 8.30 a. m.: There is a typhoon this morning not far from Yap, Western Carolines, in about 10° or 11° lat. N and 138° or 139° long. E moving at present to WNW.

The track of the typhoon in its passage from the Carolines to the Philippines was followed and announced to the public in these warnings:

August 13, 11.20 a. m.: The typhoon was situated this morning at 6 o'clock to the NW of Yap, in about 134° long. E and between 12° and 13° lat. N moving WNW.

August 14, 11.15 a. m.: The typhoon was situated at 6 o'clock this morning to the E of Luzon in about 130° long. E and between 14° and 15° lat. N moving WNW.

August 15, 10.55 a. m.: The typhoon was situated at 6 o'clock this morning to the E of Luzon in about 126° long. E and 16° or 17° lat. N moving WNW.

August 15, 4 p. m.: The typhoon is approaching slowly the northern part of Luzon. It will probably cross or pass very near the Cagayan Province.

August 16, 8.30 a. m.: The typhoon is situated this morning in the neighborhood of Aparri and continues moving WNW.

In the following table are given some of the observations made on the 15th and 16th in the stations of Tuguegarao, Aparri, Santo Domingo (Batanes), and Laoag, and in Plate X are six sets of isobars by means of which the reader may follow the track of the typhoon from the time that it appeared in the Carolines till it entered the Continent to the N of Indo-China.

METEOROLOGICAL OBSERVATIONS FOR AUGUST 15 AND 16, 1913.

Date and hour.	Tuguegarao.				Aparri.				Santo Domingo.				Laoag.			
	Pres- sure.	Wind.		Rainfall ev- ery 4 hours.	Pres- sure.	Wind.		Rainfall ev- ery 4 hours.	Pres- sure.	Wind.		Rain- fall.	Pres- sure.	Wind.		Rain- fall.
		Direction.	Force.			Direction.	Force.			Direction.	Force.			Direction.	Force.	
August 15:	mm.		0-12	mm.	mm.		0-12	mm.	mm.		0-12	mm.	mm.		0-12	mm.
6 a. m.	754.51	NE	1	-----	754.28	NW	4	-----	754.50	N	2	1.2	755.22	Calm		-----
2 p. m.	51.54	N	2	-----	51.86	NW	6	-----	52.04	N	3	0.7	53.92	NNW	2	-----
10 p. m.	48.07	NW	4	22.1	47.88	NNW	7	31.5	49.36	NE	4	24.1	49.95	NW	3	6.3
August 16:																
1 a. m.	44.50	NW	6	-----	43.90	NNW	7	-----				-----	48.14	NNW	4	3.8
2 a. m.	43.04	NW	4	7.4	42.07	NW	7	1.3				-----	46.90	NNW	4	1.3
3 a. m.	41.37	Calm		-----	40.07	NW	8	-----				-----	45.80	NNW	5	2.5
4 a. m.	40.33	WSW	3	-----	37.53	NW	8	-----				-----	45.07	NNW	5	4.8
5 a. m.	40.10	SW	2	-----	35.08	NW	9	-----	43.64	ENE	7	22.9	44.47	NNW	5	5.8
6 a. m.	39.51	S	7	4.1	32.87	W	10	9.9	42.44	ENE	7	0.5	43.72	NNW	6	4.3
6:30 a. m.				-----	32.09	W	10	-----				-----				-----
7 a. m.	40.35	SE	7	-----	32.39	SW	9	-----	42.69	ENE	7	0.2	42.82	NW	6	7.4
8 a. m.	41.88	SSE	8	-----	32.66	S	11	-----	42.80	ENE	7	6.6	40.39	NW	6	6.1
9 a. m.	44.13	SE	8	-----				-----	43.70	E	6	6.1	39.29	WNW	7	5.1
10 a. m.	45.06	SE	7	5.3	38.80	SE	11	8.9	44.23	E	7	1.0	38.89	WNW	7	7.4
11 a. m.				-----				-----				-----	38.16	W	8	8.9
Noon				-----				-----	45.11	ESE	6	-----	40.04	WSW	10	13.2
1 p. m.				-----				-----				-----	41.78	SW	10	24.9
2 p. m.	48.95	SE	6	-----	46.19	SSE	10	6.4	46.56	ESE	6	-----	42.98	SSW	10	31.7
4 p. m.				-----				-----	48.16	SE	6	-----				-----
6 p. m.	52.23	SSE	4	-----	51.31	SSE	3	2.5	50.39	SE	6	-----				-----

\* Rainfall from 3.45 p. m.

The observer of Aparri forwarded these notes with reference to that part of the Babuyan Islands over which the vortex of the typhoon passed:

According to information received from a Spanish resident of the island of Fuga, the vortical calm was observed on that island at 9.30 a. m.<sup>1</sup> of the 16th. The calm lasted about 20 minutes and it was followed by winds which were so violent that they threw down the houses and uprooted many coconut palms. The sea washed up on the island for about 500 meters.

An American living on the island of Camiguin informs me that not a single house was left standing on the island, and that the islanders were forced to flee to the mountains for the sea inundated all the level ground destroying all the coconut plantations and other plants.

Fuga and Camiguin are the two most southerly islands of the Babuyan group and are about 30 miles distant from Aparri, the first to the NW and the other to the NNE of that town.

The same observer also sent the following details of the effects of the typhoon in Aparri:

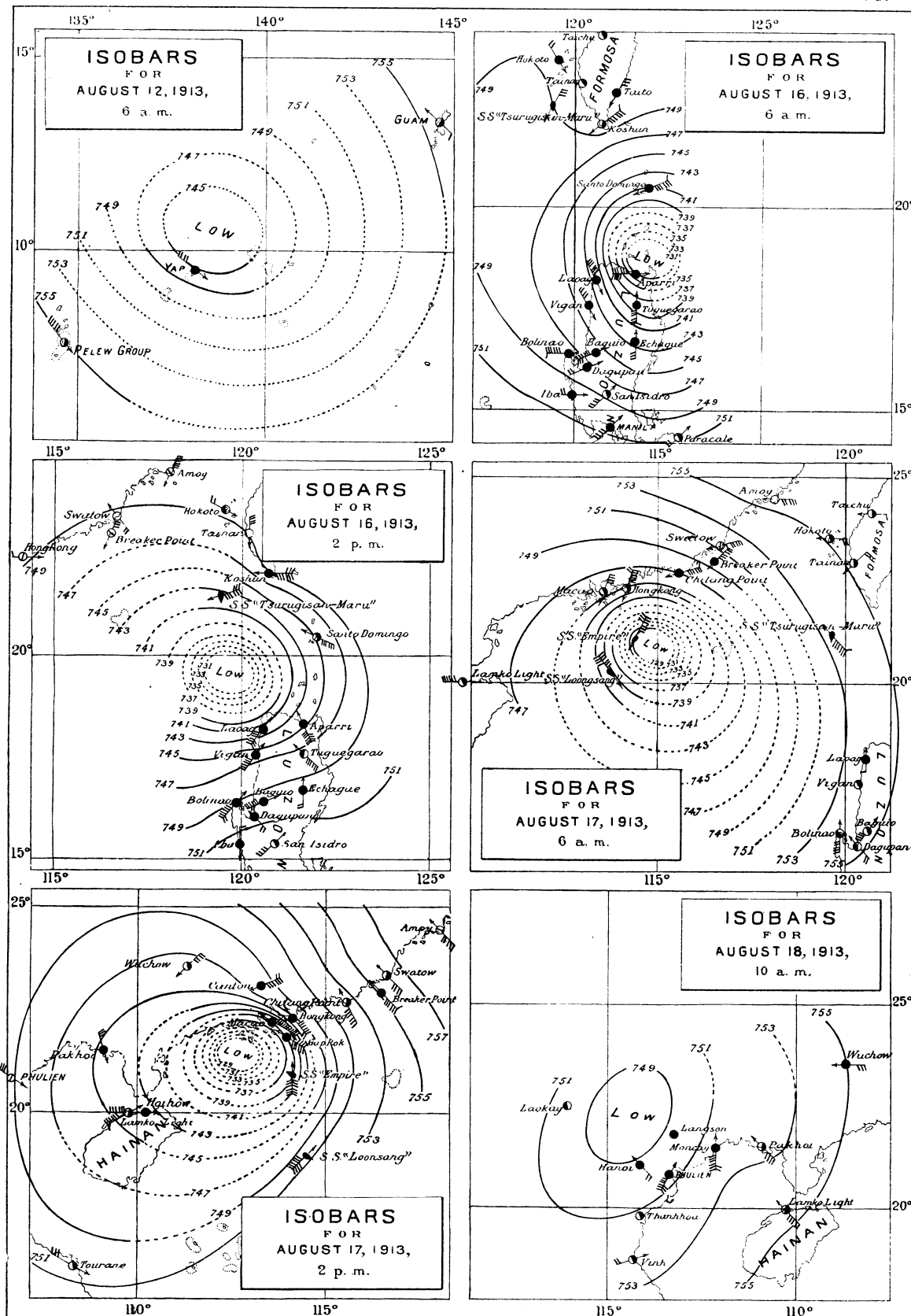
The river rose a meter above its usual level and was covered with large waves which lasted as long as the wind blew from the NW.

The houses of light material were damaged and some of them were blown down and utterly destroyed.

The steamship *Panay* at anchor in the port dragged her anchors owing to the force of the wind and went aground on a bank of sand to the east of the river.

A vessel from the Island of Calayan with a cargo of cattle was wrecked on the coast, three of the crew and part of the cattle being lost.

<sup>1</sup> The time as given in this report does not seem to be sufficiently reliable. According to the data we possess it would appear almost certain that the vortex had to pass over Fuga Island somewhat earlier than 9.30 a. m.



N.B.—The barometric readings have been reduced to standard gravity

From the Babuyan the typhoon continued its course to the WNW at the same time considerably increasing its velocity of translation. A telegram was therefore hurriedly sent to Hongkong at 6.30 p. m. of the 16th, placing the center of the storm to the W of the Balintang Channel and moving WNW. The following day the typhoon passed by the S of Hongkong before midday and broke with much intensity on that colony where the wind from the E reached a velocity 105 miles an hour during a squall. This was the severest typhoon felt in Hongkong this year.

For the plotting of the track of this typhoon across the China Sea we have made use of the observations made on board the steamships *Empire* and *Loonsang* during their trips from Hongkong to Manila, and which were kindly placed at our disposal by the respective captains. Below are the observations of both these steamers.

METEOROLOGICAL OBSERVATIONS FOR AUGUST 16 AND 17, 1913.

Date and hour.	Steamer "Empire" (Capt. E. T. Pilcher).						Steamer "Loonsang" (Capt. W. G. G. Leask).					
	Approximate position.		Pres- sure.	Wind.		State of weather.	Position.		Pres- sure.	Wind.		State of sea.
	Lat- tude north.	Longi- tude east.		Direc- tion.	Force.		Lat- tude north.	Longi- tude east.		Direc- tion.	Force.	
August 16:	° /	° /	mm.		0-12		° /	° /	mm.		0-12	
9 p. m.			750.81	N	3	o, c						
10 p. m.							21 20	114 28	751.06	Wly	2	Smooth.
11 p. m.			50.05	NEbyN	7	c			50.30	Nly	5	Moderate.
12 midnight	21 15	114 36	48.78	NNE	7	oc, q	21 00	114 30	49.29	NNE	6	Rather rough.
August 17:												
1 a. m.			46.75	N-NNE	7	oc, q						
2 a. m.			45.73	NE	9	oc			46.75	NNE	8	Rough.
3 a. m.			41.41	NE	9	oc			44.46	NNE	9	Rough.
4 a. m.			39.13	NEbyN	9	oc			43.70	NNE	9	High.
5 a. m.			34.55	NNE	9	oc			41.41	N	9	High.
6 a. m.			29.73	NNE	9	oc	20 16	113 44	40.65	NWbyN	10	Heavy.
7 a. m.			24.14	NE	9	oc, q			40.14	NWbyW	10	High.
8 a. m.			*683.17	NE	12	oc, q, r	19 55	113 50	40.90	WNW	10	High.
9 a. m.			*690.74	NE	12	oc, q, r			42.17	WNW	10	High.
10 a. m.			726.43	SSE	12	oc, q			43.95	W	10-12	High.
11 a. m.			30.24	SSE	12	oc, q			44.46	SW	10-12	High.
Noon	20 55	114 14	34.05	SSE	12	oc, q	19 17	114 17	48.52	SW	10-12	Very High.
1 p. m.			39.13	SE	10	oc			50.30	SW	11	
2 p. m.			40.40	S	12	oc, q, r	18 55	114 30	52.33	SW	10	
3 p. m.			41.67	S	12	oc, q, r						
4 p. m.			44.21	S	12	oc, q	18 40	115 13	52.84	SW	8	High.
5 p. m.			46.75	S	10	oc, q			54.11	S	6	Moderate.
6 p. m.	21 00	113 58	49.29	S	10	oc, q, r						
8 p. m.			53.10	SSW	8	oc, q, r	18 28	115 35	56.65	SE	5	Moderate.
10 p. m.			55.89	SSE	7	oc, r						
12 midnight			57.92	SSE	6	c						

\* The barometric readings for 8 and 9 a. m. as given in the captain's report are 27.03 inches (686.55 mm.) and 27.33 inches (694.17 mm.); but as they were taken with a mercurial barometer, it being impossible to get readings so low from the barocyclonometer, we had to correct them for temperature, and hence the readings given in this table: 683.17 mm. (26.897 inches) and 690.74 mm. (27.195 inches).

The observations of the *Empire* were also accompanied by the following detailed report of what happened during the typhoon:

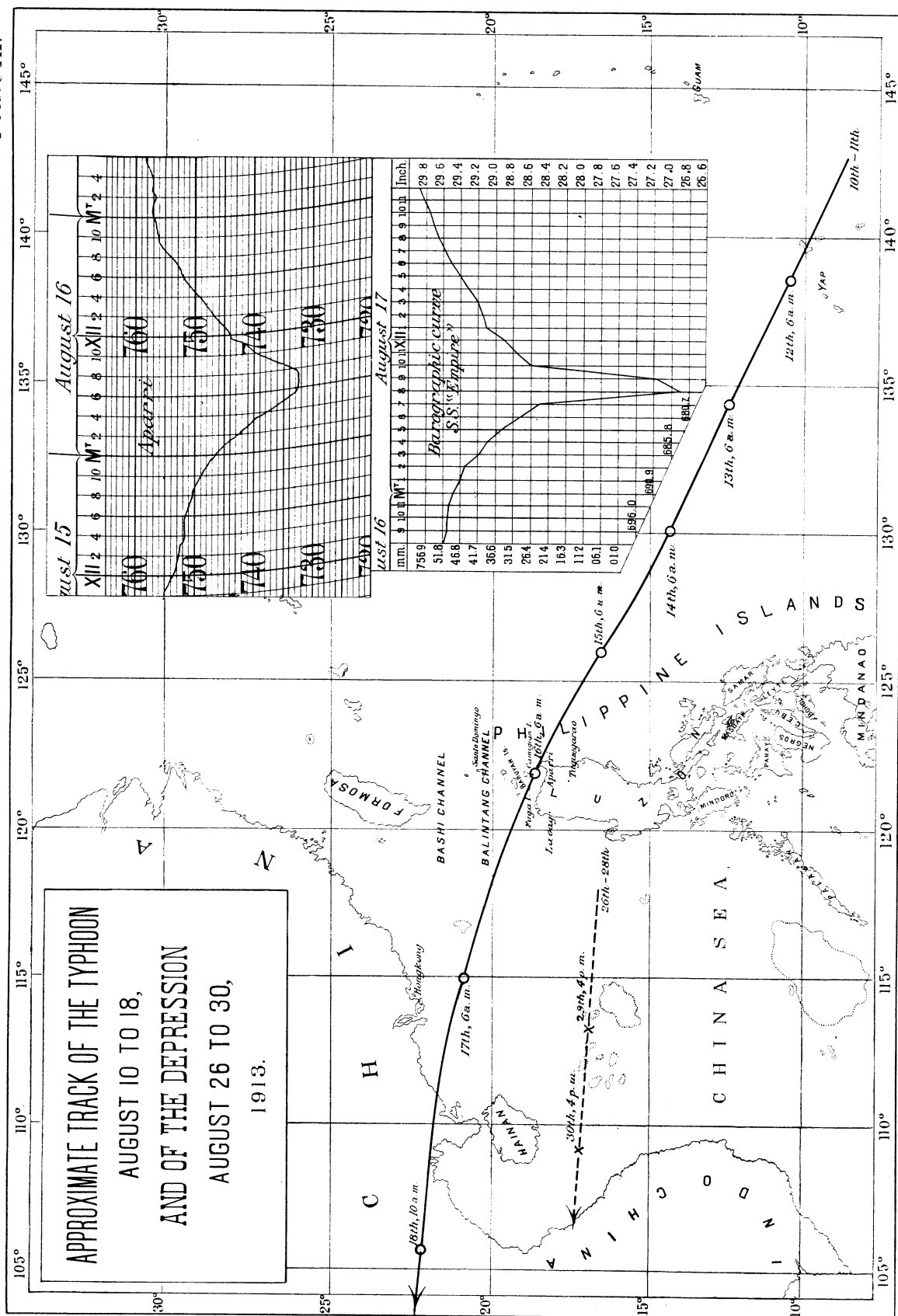
On August 16 we left Hongkong at 6 p. m. On leaving harbor the weather appeared quite fine and the sea was perfectly smooth. The barometer had a tendency to rise till 8 p. m.

The wind came away from the ENE in a fierce squall at 9.30 p. m. The squall appeared very black but was not accompanied by any rain; no rain felt till 7.30 a. m. of the 17th. The force of the wind when the barometer stood at 27.03 inches<sup>1</sup> is not overestimated if I say that it reached the velocity of 120 miles an hour for about 20 minutes. The sea was so bad at 2 a. m. of the 17th that I feared to run back to Hongkong as the ship would have been badly damaged, and I also feared that the rain area would be upon us and that we would be unable to identify the land when we did see it and be close on a dead lee shore.

In spite of the heavy sea when the barometer stood at 27.03, the wind was so fierce that it flattened the sea and the spume which it cut off from the sea drove horizontally and holding the palm

<sup>1</sup> See the footnote on the table of observations.

Plate XI.



of the hand exposed to it caused great pain. It was impossible to judge if there was rain at this time for the spray was so thick that the deck could not be seen from the bridge. Throughout the typhoon very little damage was done by the sea, which I attribute to being hove to on the port tack and I kept the sea well on the bow and had I been on the starboard tack as the wind shifted I would have come directly end on to the sea and undoubtedly have been swept fore and aft. This typhoon was phenomenal in many respects as the moon was visible most of the time during the night and the sun during the day, the sky being covered with a light cirrus veil. The weather did not clear up as it usually does (after the typhoon). The sky looked very bad on the evening of the 17th, and vivid sheet lightning was observed southward. In fact, except that the barometer was rising, the look of the sky and the sultriness of the atmosphere appeared more in keeping with an advancing typhoon rather than a receding one.

There was no typhoon swell until 10.30 p. m. of the 16th, and then it was not very well defined.

The barometric minimum mentioned in this report is doubtless one of the lowest ever recorded in the Far East.

That the typhoon increased its velocity of translation may be seen in Plate XI, for on the track there shown the typhoon moved from 6 a. m. of the 14th till 6 a. m. of the 16th with a mean velocity of 11.2 miles per hour, while from 6 a. m. of the 16th to 6 a. m. of the 17th it moved with a velocity of 17.3 miles per hour. With reference to the last part of the track of this typhoon the following was said by Manila Observatory on the 17th and 18th:

August 17, 11 a. m.: The typhoon has continued moving WNW across the China Sea, its center being situated early this morning to the SE of Hongkong.

August 18, 11.25 a. m.: The typhoon passed yesterday before noon to the S of, and not far from, Hongkong. Its center is situated this morning over the Continent to the N of Indo-China moving westward.

We copy here the warnings exchanged between the Observatories of Hongkong and Manila, and those sent by the Observatory of Zikawei to the stations along the China coast:

#### MANILA.

August 11, 4.50 p. m.: Typhoon near or over the Western Carolines, direction unknown.

August 12, 6.55 a. m.: Typhoon near or over Yap, moving WNW.

August 13, 9.20 a. m.: Typhoon NW of Yap, moving WNW.

August 14, 11.15 a. m.: Typhoon E of Luzon, more than 300 miles distant, moving WNW.

August 15, 10.50 a. m.: Typhoon E of Luzon, less than 300 miles distant, moving WNW.

August 16, 8.20 a. m.: Typhoon near or over Aparri, moving WNW.

August 16, 6.30 p. m.: Typhoon W of Balintang Channel, moving WNW.

#### HONGKONG.

August 15, 10.40 a. m.: Typhoon E of Luzon, moving WNW.

August 16, 10.55 a. m.: Typhoon near the Balintang Channel, moving WNW.

August 16, 11.00 p. m.: Typhoon west of Balintang Channel, moving WNW.

#### ZIKAWEI.

August 11, 9 p. m.: Typhoon, N to E of Yap, within 240 miles, direction WNW.

August 12, 9.20 a. m.: Typhoon N to W of Yap, within 240 miles, direction WNW.

August 13, noon: Typhoon, NW of Yap, beyond 240 miles, direction WNW.

August 14, 3.25 p. m.: Typhoon, far east of the Philippines, direction WNW.

August 15, 10 a. m.: Typhoon, E of Luzon, direction WNW.

August 16, 10 a. m.: Typhoon in the Balintang Channel, direction WNW.

August 16, 9 p. m.: Typhoon, Pratas, direction WNW.

August 17, noon: Typhoon SE of Hongkong, beyond 120 miles, direction WNW.

August 17, 9 p. m.: Typhoon SW of Hongkong, direction WNW.

August 18, 9 p. m.: Typhoon on NW of Tongking, direction NW.

**Typhoon of August 21 to 28, 1913.**—This typhoon had no importance whatsoever for the Philippines. It was, however, the most severe that visited Japan during the year.

The newspapers of Manila of August 30 and 31 published this telegram received from Tokyo:

This city has been visited by a destructive typhoon. In Tokyo alone 15,000 houses have been submerged and it is feared that there have been many casualties. It is known that 15 children have perished while they were climbing Mount Komagatake in search of refuge. The railroads and crops have suffered severely.

The track which we give in Plate IX is taken in great part from the "Journal of the Meteorological Society of Japan," October, 1913.

The Observatory of Manila made mention of this typhoon in the ordinary weather notes of the 25th, 26th, and 27th in these terms:

August 25, 11.10 a. m.: Pressure is lowest over the Pacific to the W or WSW of the Bonins.

August 26, 11.45 a. m.: There is a far-distant typhoon over the Pacific to the NW of the Bonins moving apparently northeastward.

August 27, 11.50 a. m.: The typhoon of the Bonins has been moving northward since yesterday.

**The typhoon of August 26 to 28, 1913.**—This atmospheric disturbance appeared on the 26th to the W of Guam and N of Yap, between  $137^{\circ}$  and  $139^{\circ}$  long. E and between  $13^{\circ}$  and  $14^{\circ}$  lat. N. It moved at first to the W, recurved to the NW on the 27th, and to the N on the 28th, finally breaking up on the 29th near  $19^{\circ}$  lat. N and  $130^{\circ}$  and  $131^{\circ}$  long. E.

The Manila Observatory announced this typhoon with the following notes:

August 27, 9.55 a. m.: There are signs of a typhoon over the Pacific to NW of Yap, Western Carolines, in about  $13^{\circ}$  or  $14^{\circ}$  lat. N and  $133^{\circ}$  or  $134^{\circ}$  long. E, moving apparently W. or WNW.

August 28, 9.25 a. m.: The typhoon of the Pacific is still far to the E of Luzon, it being impossible for the present to know whether it will be dangerous for Luzon.

August 29, 11.45 a. m.: The typhoon of the Pacific seems to be filling up to the E of northern Luzon.

**The depression of August 26 to 30, 1913.**—This depression was indicated very clearly by the observations made along the western coast of Luzon on the 26th and 27th. It appears to have remained almost stationary till the 28th between Luzon and the Paracels. On the 28th it began its march to the W, passing by the S of Hainan on the afternoon of the 30th. It probably filled up on reaching the coast of Indo-China.



## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes es para casi todas las estaciones de Filipinas ligeramente mayor que la del año pasado. Las presiones más altas ocurrieron el 25 ó el 17 y 18, y las más bajas el 15 y 16.

La temperatura media mensual apenas difiere de la de Agosto, 1912, siendo la diferencia más notable  $+0.6^{\circ}$  C., la cual corresponde a la estación de Aparri. Las temperaturas extremas de Manila fueron  $32.9$  y  $22.3^{\circ}$  C. registradas respectivamente los días 18 y 30.

**Precipitación acuosa.**—Si comparamos los totales de lluvia de este mes con los del mismo mes del año pasado, hallaremos que, a excepción de las estaciones de Mindanao, una gran mayoría de las demás estaciones nos dan una diferencia negativa. Al contrario, si los comparamos con los valores normales de Agosto, tendremos que es bastante mayor el número de estaciones que aparecen con un *superavit* de lluvia. Véase a este fin la tabla de lluvia que acompaña el texto inglés. En los pluviómetros de Manila se recogieron en todo el mes  $349.1$  mm. de agua, cantidad que difiere en  $-307.5$  mm. de la de Agosto, 1912, y en  $-9.9$  mm. de la normal de Manila para este mes.

## DEPRESIONES Y TIFONES.

Seis son los tifones o depresiones que durante este mes anunció el Observatorio, si bien solo uno de ellos cruzó las Filipinas a través de las Islas Babuyanes muy cerca de la costa norte de Luzón. Las trayectorias de todos ellos van incluidas en las láminas IX y XI.

**Depresiones o tifones de 31 de Julio a 9 de Agosto, 1913.**—Decía el Observatorio en la nota ordinaria del tiempo del 1 de Agosto:

Agosto 1, 11.40 a. m.: Hay indicios de una nueva depresión o tifón que se forma en el Pacífico al este de Filipinas. Otro tifón aparece en los alrededores de la parte septentrional de las Islas Ladroneas o Marianas. Este último, sin embargo, no será peligroso para Filipinas.

El día siguiente se decía que tampoco había peligro ninguno por parte del otro tifón formado al E de Filipinas:

Agosto 2, 11.40 a. m.: El nuevo tifón mencionado ayer mañana permanece muy lejos en el Pacífico a medio camino entre las Carolinas Occidentales y las Islas Liukiu, y se mueve aparentemente hacia el norte. De ahí que no es peligroso para Filipinas. El otro tifón de las Islas Ladroneas o Marianas está recurvando probablemente al nordeste.

Sobre el tifón de Marianas dijimos además en la nota del tiempo del día 3:

Agosto 3, 11 a. m.: El tifón de las Islas Ladroneas o Marianas se halla esta mañana al SE de Bonins, moviéndose al nordeste.

La trayectoria del otro tifón se fué siguiendo diariamente en las notas del tiempo de los días 3 a 7 en estos términos:

Agosto 3, 11 a. m.: El tifón del Pacífico se hallaba a las 6 de esta mañana al nordeste de Filipinas en los alrededores de  $133^{\circ}$  longitud E y  $20^{\circ}$  latitud N moviéndose aparentemente al NNW.

Agosto 4, 11.30 a. m.: El tifón del Pacífico ha estado recurvando al nordeste desde ayer, hallándose su centro esta mañana al SW de Bonins, en los alrededores de  $22^{\circ}$  ó  $23^{\circ}$  latitud y entre  $135^{\circ}$  y  $137^{\circ}$  longitud E.

Agosto 5 y 6: El tifón del Pacífico permanece casi estacionario al SW de Bonins.

Agosto 7, 11.40 a. m.: El tifón del Pacífico se halla al WSW de Bonins, moviéndose aparentemente al NNE.

Además de las observaciones que nos sirvieron para dar estas notas hemos tenido a la vista al trazar las trayectorias de estos dos tifones los tres mapas diarios de Japón. Con todo, estos datos no son suficientes para que podamos dar a dichas trayectorias un valor más que probable.

**Tifón de 10 a 18 de Agosto, 1913.**—Pertenece este tifón al tipo de los que se forman

en o cerca de las Carolinas Occidentales, dando por lo tanto tiempo para ser anunciados mucho antes de llegar a Filipinas. En el texto inglés damos en una tabla algunas de las observaciones hechas en nuestra estación de Yap, Carolinas Occidentales, del 10 al 13 de este mes. En ellas se fundó el Observatorio al enviar la tarde del 11 el siguiente primer aviso de tifón a los Centros Meteorológicos del Extremo Oriente:

Agosto 11, 4.50 p. m.: Tifón en o cerca de las Carolinas Occidentales; dirección desconocida.

La madrugada del día siguiente la bajada del barómetro en Yap era tan pronunciada y los vientos tan declarados del NW y W, que no podía caber la menor duda de que el tifón iba a pasar muy cerca por el norte de aquella estación y que se movía en dirección al WNW. Así se dijo en el siguiente aviso de tifón dado en Manila la mañana del 12:

Agosto 12, 8.30 a. m.: Hay un tifón esta mañana no lejos de Yap, Carolinas Occidentales, en los alrededores de  $10^{\circ}$  ó  $11^{\circ}$  latitud N y  $138^{\circ}$  ó  $139^{\circ}$  longitud E, moviéndose al presente al WNW.

La trayectoria de este tifón desde Carolinas hasta Filipinas fué seguida y anunciada de una manera aproximada por el Observatorio de Manila con estas notas o avisos de tifón:

Agosto 13, 11.20 a. m.: El tifón se hallaba a las 6 de esta mañana hacia el NW de Yap, en los alrededores de  $134^{\circ}$  longitud E y entre  $12^{\circ}$  y  $13^{\circ}$  latitud N moviéndose al WNW.

Agosto 14, 11.15 a. m.: El tifón se hallaba a las 6 de esta mañana al E de Luzón en los alrededores de  $130^{\circ}$  longitud E y entre  $14^{\circ}$  y  $15^{\circ}$  latitud N, moviéndose al WNW.

Agosto 15, 10.55 a. m.: El tifón se hallaba a las 6 de esta mañana al E de Luzón en los alrededores de  $126^{\circ}$  longitud E y  $16^{\circ}$  ó  $17^{\circ}$  latitud N moviéndose al WNW.

Agosto 15, 4 p. m.: El tifón se está acercando a la parte norte de Luzón. Probablemente cruzará o pasará muy cerca de la Provincia de Cagayán.

Agosto 16, 8.30 a. m.: El tifón se halla esta mañana en los alrededores de Aparri, y continúa moviéndose al WNW.

En el texto inglés publicamos reunidas en una tabla algunas de las observaciones hechas los días 15 y 16 en las estaciones de Tuguegarao, Aparri, Santo Domingo (Batanes) y Laoag. Además en la Lámina X damos seis mapitas de isobaras para que nuestros lectores puedan seguir por sí mismos la trayectoria de este tifón desde que se presentó en las Carolinas hasta que se internó en el Continente al Norte de Indochina.

El observador de Aparri nos facilitó los siguientes datos referentes a la parte de las islas Babuyanes por donde pasó el vórtice del tifón:

Según informes de un español residente en la isla de Fuga, la calma vortical se observó en aquella isla el día 16 a eso de 9.30 a. m.<sup>1</sup> Duró la calma unos 20 minutos, sucediéndose después los vientos posteriores que fueron los que derribaron las casas y muchos cocoteros. El mar se internó en la isla unos 500 metros.

También me informó un americano residente en la isla Camiguín que de las 50 ó 60 casas que hay en la isla no ha quedado ni una sola en pie, y que los isleños tuvieron que internarse en el monte porque el mar inundó toda la parte llana destruyendo todo el sembrado de cocoteros y otras plantas.

Las islas Fuga y Camiguín son las dos más meridionales del grupo de Babuyanes. Ambas distan unos 30 millas de Aparri, y están situadas, la primera al NW, y la segunda al NNE de dicha población.

El mismo observador nos dió los siguientes detalles sobre los efectos del baguio en Aparri:

El agua del río creció un metro sobre su nivel ordinario con grandes olas que duraron mientras sopló el viento del NW.

El caserío de materiales ligeros ha sufrido desperfectos y algunas casas fueron derribadas o destruidas completamente.

Al vapor *Panay* que estaba fondeado en este puerto le garrearón las anclas por la violencia del viento, quedando embarrancado sobre un banco de arena que hay al E del río.

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<sup>1</sup> Esta hora no parece de confianza, pues según los datos que poseemos tenemos por cierto que el vórtice hubo de pasar por la isla Fuga algo más temprano.

Una embarcación que venía de la isla Calayán con cargamento de vacunos se fué a pique cerca de esta costa pereciendo tres personas y parte del ganado.

Desde las islas Babuyanes siguió el tifón su marcha al WNW al propio tiempo que aumentaba considerablemente su velocidad de traslación. De ahí que se apresurase el Observatorio a enviar un telegrama a Hongkong a 6.30 p. m. del 16 situando ya el centro al W del canal de Balintang y moviéndose al WNW. El día siguiente pasó por el sur de Hongkong antes de mediodía, desfogando con mucha intensidad en aquella colonia donde el viento del E alcanzó en un chubasco la velocidad de 105 millas por hora. De hecho ha sido éste el baguio más intenso sentido en Hongkong durante este año.

Para trazar la trayectoria de este tifón a través del Mar de China nos han servido las observaciones hechas a bordo de los vapores *Empire* y *Loonsang* en viaje de Hongkong a Manila, las cuales agradecemos a sus respectivos capitanes. En el texto inglés damos estas observaciones reunidas en una sola tabla. A las observaciones del *Empire* acompaña un report detallado de lo observado durante este tifón que por lo interesante nos ha parecido darlo casi íntegro en el texto inglés. La mínima barométrica de este barco observada con un barómetro de mercurio fué 683.17 mm., resultando sin duda una de las más bajas que se llevan registradas en el Extremo Oriente.

Que el tifón aumentó en velocidad los días 16 y 17, se echa de ver claramente en la trayectoria que damos en la Lámina XI. Según ella, se había movido desde 6 a. m. del 14 hasta 6 a. m. del 16 con una velocidad media de 11.2 millas por hora, mientras que de 6 a. m. del 16 a 6 a. m. del 17 se movió con una velocidad media de 17.3 millas por hora.

El Observatorio de Manila dijo lo siguiente los días 17 y 18 refiriéndose a la última parte de la trayectoria de este tifón:

Agosto 17, 11 a. m.: El tifón ha continuado moviéndose al WNW a través del Mar de China, hallándose su centro esta madrugada al SE de Hongkong.

Agosto 18, 11.25 a. m.: El tifón pasó ayer antes de mediodía por el sur y no lejos de Hongkong. Su centro se halla esta mañana en el Continente al N de Indochina, moviéndose al W.

Terminamos la discusión de este baguio copiando aquí los avisos de tifón que se cambiaron entre los observatorios de Hongkong y Manila, y también los enviados por el observatorio de Zikawei a las estaciones de la costa de China.

#### MANILA.

Agosto 11, 4.50 p. m.: Tifón en o cerca de las Carolinas Occidentales, dirección desconocida.

Agosto 12, 6.55 a. m.: Tifón en o cerca de Yap, moviéndose al WNW.

Agosto 13, 9.20 a. m.: Tifón al NW de Yap, moviéndose al WNW.

Agosto 14, 11.15 a. m.: Tifón al E de Luzón, distancia mayor de 300 millas, moviéndose al WNW.

Agosto 15, 10.50 a. m.: Tifón al E de Luzón, distancia menor de 300 millas, moviéndose al WNW.

Agosto 16, 8.20 a. m.: Tifón en o cerca de Aparri, moviéndose al WNW.

Agosto 16, 6.30 p. m.: Tifón al W del canal de Balintang, moviéndose al WNW.

#### HONGKONG.

Agosto 15, 10.40 a. m.: Tifón al E de Luzón, moviéndose al WNW.

Agosto 16, 10.55 a. m.: Tifón cerca del canal de Balintang, moviéndose al WNW.

Agosto 16, 11.00 p. m.: Tifón al W del canal de Balintang, moviéndose al WNW.

#### ZIKAWEI.

Agosto 11, 9.00 p. m.: Tifón al NE de Yap, distancia menor de 240 millas, dirección WNW.

Agosto 12, 9.20 a. m.: Tifón al NW de Yap, distancia menor de 240 millas, dirección WNW.

Agosto 13, mediodía: Tifón al NW de Yap, distancia mayor de 240 millas, dirección WNW.

Agosto 14, 3.25 p. m.: Tifón, lejos al E de Filipinas, dirección WNW.

Agosto 15, 10 a. m.: Tifón al E de Luzón; dirección WNW.

Agosto 16, 10 a. m.: Tifón en el Canal de Balintang, dirección WNW.

Agosto 16, 9 p. m.: Tifón en Pratas, dirección WNW.

Agosto 17, mediodía: Tifón al SE de Hongkong, distancia mayor de 120 millas, dirección WNW.

Agosto 17, 9.00 p. m.: Tifón al SW de Hongkong, dirección WNW.

Agosto 18, 9.00 p. m.: Tifón al NW de Tongking, dirección NW.

**Tifón de 21 a 28 de Agosto, 1913.**—Este tifón no fué de importancia alguna para Filipinas. En cambio puede calificarse como el más intenso que ha visitado Japón durante ese año 1913. Los periódicos de Manila del 30 y 31 de Agosto publicaron este telegrama recibido de Tokyo:

Esta ciudad ha sido visitada por un tifón muy destructor. Solamente aquí en Tokyo 15,000 casas han sido sumergidas y se teme ha habido muchas víctimas. Se sabe que 15 niños perecieron mientras subían en busca de refugio al monte Komagatake. Las vías férreas y las cosechas han sufrido mucho.

La trayectoria que damos de este tifón en la Lámina IX está tomada en su mayor parte del "Journal of the Meteorological Society of Japan, October, 1913."

El Observatorio de Manila hizo mención de este tifón en las notas ordinarias del tiempo de los días 25, 26 y 27 en estos términos:

Agosto 25, 11.10 a. m.: La presión atmosférica se halla muy baja en el Pacífico al W o WSW de las islas Bonín.

Agosto 26, 11.45 a. m.: Hay un tifón muy distante hacia el NW de las islas Bonín, moviéndose aparentemente al NE.

Agosto 27, 11.50 a. m.: El tifón de las islas Bonín se ha movido al N desde ayer mañana.

**Tifón o depresión de 26 a 28 de Agosto, 1913.**—Apareció esta perturbación atmosférica el día 26 al W de Guam y N de Yap entre los meridianos  $137^{\circ}$  y  $139^{\circ}$  E y los paralelos  $13^{\circ}$  y  $14^{\circ}$  N. Se movió primero al W, recurvó al NW el 27, y al N el 28, viniendo a deshacerse la mañana del 29 en los alrededores de  $19^{\circ}$  latitud N y  $130^{\circ}$  ó  $131^{\circ}$  longitud E.

El Observatorio de Manila anunció este tifón por medio de las siguientes notas:

Agosto 27, 9.55 a. m.: Hay indicios de un tifón en el Pacífico al NW de Yap, Carolinas Occidentales, en los alrededores de  $13^{\circ}$  ó  $14^{\circ}$  latitud N y  $133^{\circ}$  ó  $134^{\circ}$  longitud E, moviéndose aparentemente al W o WNW.

Agosto 28, 9.25 a. m.: El tifón del Pacífico se halla aún lejos al E de Luzón siendo imposible por ahora decir si será o no peligroso para Luzón.

Agosto 29, 11.45 a. m.: El tifón del Pacífico se está rellenando al E del norte de Luzón.

**Depresión de 26 a 30 de Agosto.**—Esta depresión fué indicada muy claramente por las observaciones hechas a lo largo de la costa occidental de Luzón los días 26 y 27. Parece que permaneció casi estacionaria hasta el día 28 entre Luzón y las islas Paracels. El 28 emprendió su marcha al W, pasando por el S de Hainán la tarde del día 30. Probablemente se deshizo al llegar a la costa de Indochina.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.			Free expo- sure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.				
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.
1	756.49	25.6	29.5	24.1	27.3	28	27.9	28.3	29.5	29.2	94	22.9	0.2	0.9
2	57.35	25	27.8	23.5	27	27	28	28.1	29.4	29.2	90.3	21.3	1.3	1.5
3	57.80	25.8	30.4	24	27	28.2	28	28	29.4	29.3	86.1	21.2	1.8	2
4	57.12	24.7	27.6	23.6	27.4	27.4	28.3	28.3	29.4	29.3	93	21.5	0	.6
5	56.36	25.6	30.2	22.9	27	28	28	28.1	29.4	29.3	89.7	21.8	2	1.5
6	56.42	26.1	31.4	23.8	27.8	28.6	28.3	28.4	29.2	29.1	88.9	22.3	1.9	1.6
7	56.78	25.9	29.7	23.5	27.6	28.5	28.3	28.6	29.1	29	87.1	21.6	1.7	1.6
8	57.63	26.2	30.4	23.5	27.8	28.5	28.6	28.7	29.1	29.3	88.6	22.4	2.2	1.6
9	57.86	27.3	31.9	23.9	28.4	29.3	28.8	29	29.2	29.3	85	22.8	3.1	2.5
10	57.47	27.9	32.1	25.5	28.9	29.6	29.2	29.4	29.1	29.2	84.6	23.7	3	2.4
11	56.73	26.4	31.2	23.9	28.8	29	29.3	29.3	29.1	29	90.2	23.1	.5	1.2
12	56.96	26.1	31	23.6	28.4	29.1	29.1	29.2	29.1	29.1	86.9	21.7	3.2	2
13	57.01	26.5	31	23.7	28.8	29.6	29.4	29.5	29.1	29.2	84.8	21.8	2.7	2.2
14	56.64	26.4	29.8	24.2	28.7	29.5	29.3	29.6	29.1	29.1	88.3	22.5	2.2	1.7
15	53.97	27.5	32	24.5	28.7	29.6	29.4	29.5	29.2	29.2	83.4	22.7	3.7	3.5
16	54.28	25.8	30.2	23.7	28.6	28.9	29.3	29.6	29	29.1	88.8	22	1.4	1.3
17	58.60	26.4	32.4	23.1	28.4	29.5	29.4	29.4	29.1	29.1	85.9	21.9	2.1	1.7
18	59.26	26.6	32.9	23	28.6	29.5	29.3	29.3	29.3	29.1	87.7	22.5	2.2	1.9
19	57.26	26.8	32.4	23.2	29.1	30	29.5	29.8	29.2	29.2	86	22.4	2.3	1.9
20	56.58	26.3	30.6	23.4	28.8	29.5	29.6	29.8	29.2	29.1	87.9	22.3	1.8	1.4
21	56.88	27.4	32.3	24.1	29.1	30	29.6	29.8	29.3	29.2	82.5	22.3	4.2	2.8
22	56.74	27	31.4	23.7	29.4	30.5	29.8	29.9	29.3	29.1	84.4	22.3	3.6	2.5
23	56.62	27.3	31.7	24.2	29.8	30.1	29.9	30.3	29.3	29.1	83.3	22.3	4.3	2.9
24	57.51	26.4	31.8	23.5	30.2	30.4	30.4	30.5	29.3	29.1	88.6	22.6	1.5	1.7
25	58.77	25.5	29.3	23.7	29.5	29.7	30.2	30	29.2	29	88.8	21.5	.9	1.5
26	57.34	25.5	30	23.9	29.1	29.3	29.8	29.8	29.3	29.1	89	21.6	.8	1.4
27	54.06	26.3	31.1	24.1	28.7	29.2	29.6	29.7	29.2	29	87.9	22.2	1.9	1.7
28	54.44	26.4	30.6	24.5	29.3	29.8	29.8	29.9	29.3	29	85.3	21.8	2.1	2
29	57.42	26.2	31.6	23.9	29.2	29.7	29.8	29.8	29.3	29	83.8	21.1	2.5	1.9
30	58.38	26.7	31.4	22.3	29.3	30.2	29.8	30	29.3	29.1	82.9	21.4	3.9	3
31	57.98	26.6	31.5	22.9	29.2	30.5	29.9	30	29.3	29	84.3	21.7	1.7	1.5
Mean	756.93	26.3	30.9	23.7	28.6	29.2	29.2	29.3	29.2	29.1	87	22.1	2.2	1.9
Total													66.7	57.9
Departure from normal	-0.39	-0.7	+0.2	0							+2	-0.3		

Day.	Wind.				Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.
	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.		Form and its direction.				
						Upper.	Lower.			
1	SW quad.	Km. 136.5	Km. 19	SW, W	0-10.	A.-Cu.	Cu.-N. W	h. m. mm.	☉ a. p. ☐ 30 p.	
2	SW quad.	339.5	31	WSW	10	Cl.-S.	Cu.-N. W	0 00	☉ d a. d° p.	
3	SW	290	39	W	10	Cl.-S.	Cu.-N. W	0 15	☉ d° a. ☉ p.	
4	SW	332	28	SW	10		N.	0 00	☉ p a. ☉ a. p.	
5	SW	208.5	23	SW	10	A.-Cu.	Cu.-N. W	0 50	☉ d a. p.	
6	SW, SSW	342.5	31	SW	9.4	A.-Cu.	Cu. W	3 40	☉ ☉ a. ☉ p.	
7	SW	350	27	SW, SSW	10	Cl.-S.	Cu.-N. W	0 25	☉ a. p.	
8	SW	280	41	SW	9.6	A.-Cu.	Cu.-N., Cu. W	2 25	☉ a. d° p.	
9	SW	340	31	SW	6.5	A.-Cu.	Cu. W	5 45	☉ d° p.	
10	SW	532.5	31	SW	7.8	Cl.-Cu.	Cu. W	5 10	☉ ☉ a.	
11	SW	452.5	30	WSW	9.9	A.-Cu.	Cu.-N. WSW	0 30	☉ ☉ a. ☉ a. p.	
12	SW	230.5	26	WSW	8.2	A.-Cu.	Cu. W	4 55	☉ a.	
13	SW	269	24	SW	8	Cl.-S.	Cu. W by S	3 20	☉ p.	
14	SW	279	29	SW	10	Cl.-S.	Cu.-N. W quad.	0 00	☉ d° a. p.	
15	W quad.	433	34	SW by W	9.4	Cl.-S.	Cu. NW	5 15		
16	SW	488.5	46	SW	10	Cl.-S.	Cu.-N. SW	0 00	☉ a. p.	
17	SE	109.5	12	SE	8.8	Cl.-S.	Cu. E	1 00	☉ p.	
18	Variable	94	11	W, ESE	7.7	Cl.	Cu. ENE	6 10	☉ ☉ p.	
19	SW quad.	164	17.5	N	6.6	Cl.	Cu. N	5 45	☉ ☉ 30 p.	
20	SW quad.	122.5	24	SSW	9.6	Cl.-S.	Cu.-N. E, ENE	0 45	☉ d° a. ☉ p.	
21	SW	286	29	SW	5.9	Cl.	Cu. W	7 45	☉ ☉ p.	
22	SW	295.5	34	SW	4.8	Cl., A.-Cu.	Cu. W	7 40	☉ ☉ a. ☉ p.	
23	SW quad.	307	30	WSW	5.2	Cl.-S.	Cu. WNW	8 25		
24	Variable	246.5	26	SW	8.9	A.-Cu.	Cu.-N. W	3 35	☉ ☉ a. p.	
25	SW	335.5	44	SW	9.8		Cu.-N. SW	0 05	☉ a. p.	
26	SW quad.	397	40	SW	9.7	A.-Cu.	Cu.-N. WSW	1 30	☉ a. p.	
27	ESE	257.5	20	SE	9.4	Cl.-S.	Cu.-N. SW	2 30	☉ ☉ a. ☉ p.	
28	S, SW	268	29	SW	7.5	Cl., A.-Cu.	Cu. SE	4 20	☉ ☉ a. p.	
29	SW quad.	201.5	31	SW	7.4	Cl.-Cu.	Cu. SSE, S	4 40	☉ d° a. p° p.	
30	SW	231	24	SW	6.3	Cl.	Cu. SW	9 15	☉ a.	
31	SW	224	28	SW	7.8	Cl.	Cu. WNW	6 20	☉ a. p. ☉ p.	
Mean		285.3	28.7		8.5			3 19		
Total		8,843.5						102 45	349.1	
Departure from normal		-160			+0.6			-39 09	-9.9	

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.

## METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.\*

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.			0-12.	0-10.			mm.	
1..	757.20	27.8	31.3	23.5	81.8	22.7	SW quad.	1.3	6.2		Ci., Ci.-S.	Cu. W	18.3	● <sup>2</sup> a.
2..	57.56	28.3	31.8	24.5	81.3	23.1	SW	2	4.3		Ci.	Cu. W		
3..	58.02	28.4	33.2	24.7	80	22.7	SW, SSW	.3	2.7		Ci.	Cu. W		
4..	57.92	28.2	31.7	24	83.3	23.4	SSW, SW	1.2	2.2		Ci.	Cu. SW		
5..	57.81	27.3	30.2	24.6	86.8	23.3	SW quad.	1.5	4.7		Ci.-S.	Cu. SW	3	p a. ● p.
6..	57.90	27.7	30.9	24.9	80.8	22.1	S	.8	5.3		Ci.-S.	Cu. SW		
7..	58.17	28.1	33	24.3	84.8	23.9	S	1.2	4.2		Ci.-S., Ci.	Cu. SSW		
8..	58.45	28.6	32.7	24.4	78.5	22.6	SW	1.3	3.7		Ci.	Fr.-Cu. SSW		d° a.
9..	58.74	28.3	31.7	25.3	74	21	W, SW	1.3	6.8		Ci., Ci.-S.	Cu. W		1/2 p.
10..	58.32	28.1	31.8	25.1	78	22	SW, S	1	5.5		Ci.-S.	Fr.-Cu. W		
11..	57.47	28.7	32.6	25.2	73	21.1	SSW	1.3	3.7		Ci.	Cu. SW		
12..	57.35	27.5	33.3	24.2	81.7	22	S	1	5.3		Ci., Ci.-S.	Cu. SW		T° d° p.
13..	57.05	27.1	33.3	23.7	81.7	21.3	S	.8	8.7		Ci.-S.	Cu. SW		d° 1/2 p.
14..	56.50	28.6	33.3	25.2	78	22.4	SW, W	1.2	8		Ci.-S.	Cu. W quad.		1/2 p.
15..	55.80	28.4	33.5	25.9	76.8	21.9	SW	2.3	8		Ci.-S.	Cu. W		d° 1/2 p.
16..	57.13	28.1	30.9	25.5	77.2	21.7	S	2	8.8		Ci.-S.	Fr.-Cu. SW		d° 1/2 p.
17..	58.54	27	31.9	23.2	88	23.1	S	.7	7		Ci.-S.	Cu. SW		d° p.
18..	58.31	26.9	30.3	23.6	88.2	23.1	Variable	.5	7.2		Ci., Ci.-S.	Fr.-Cu. W	93	● <sup>2</sup> 1/2 p.
19..	57.54	25.6	29.3	21.9	86.3	20.8	Variable	1.5	9.3		Ci.-S.	Fr.-Cu. SW		● <sup>2</sup> a.
20..	57.25	27.1	31.2	24.4	83	22.1	SW, S	2.7	7.7		Ci.-S.	Cu. SSW		
21..	57.58	27	31.2	24.9	81.7	21.4	S quad.	1.8	6.3		Ci.-S., Ci.	Cu. SW quad.		d° p.
22..	57.58	27.1	30.4	24.9	83.2	22	SW	2	7		Ci.-S.	Variable W		
23..	57.72	27.3	30.9	24.7	81.7	21.8	SW	1.8	6.8		Ci.-S.	Fr.-Cu. WSW, W		
24..	58.30	27.8	33	24.7	83.2	22.8	SW quad.	1.2	7.7		Ci.-S.	Cu. SW		
25..	59.43	27.7	31.3	24.5	79.2	21.7	SW	1.3	8.3		Ci.-S.	Cu. W, SW		
26..	58.69	28	32	24.7	80.2	22.3	SW quad.	2.2	9.2		Ci.-S.	Cu. SW, WSW		d° a.
27..	57.04	25.8	29.8	23.3	91.2	22.4	SW	1.3	9.7		Ci.-S.	Cu., Fr.-N. W	7.1	● a. p.
28..	57.32	25.3	28.2	22.7	89	21.2	SW	2.7	9.2		Ci.-S.	Fr.-N. W	4.3	● a. p.
29..	58.70	25.8	28.9	22.2	86	21.1	SW	1	9.7		Ci.-S.	Cu. SW, W	5.6	d° a. ● p.
30..	58.71	24.9	29	22	90	20.9	S, SSW	1.3	8.8		Ci.-S.	Cu. SW	7.9	● d° p.
31..	57.84	26	30.3	22.5	85.2	21	S, SSW	.5	9.3		Ci.-S.	Cu. SW, W		
Mean	757.80	27.4	31.4	24.2	82.4	22.1			1.4	6.8				
Total													139.2	

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum. <sup>b</sup>			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.		Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.	
1.	756.60	29	32.1	26.6	70.3	20.8	WSW	411.4	9.3	A.-Cu.	S	Cu.-N.	SW		○ a. 1/4° 1/2 d p.
2.	56.95	29	33	26.3	70.3	20.8	WSW	463.4	7	A.-Cu.	S	Cu.-N.	SW		○ a. p.
3.	57.66	28.9	33.1	26.4	68.5	20.2	SW quad.	321.8	4.3	A.-Cu.	S	Cu., S.-Cu.	SW		○ p.
4.	57.58	29.4	33.7	27.2	68.8	20.8	SW quad.	398	3.7	Ci.		Cu.	SW		○ p.
5.	57.16	29.2	33.7	27.1	69.2	20.5	WSW	378.9	5.2	Ci.	ENE	Cu.-N.	SW		○ p.
6.	57.50	28.3	33	25.6	72	20.5	WSW	302.7	6.8	Ci.-S.		Cu.	SW		○ a. 1/2 p.
7.	57.83	28.6	34.1	24.2	72	20.5	WSW, SW	213.5	5.7	Ci.	NE	Cu.	SW		○ a. 1/2 p.
8.	58.13	28.8	34.3	25.5	72.3	20.9	SW quad.	240.4	3.5	A.-Cu.	SW	Cu.	SW		○ p.
9.	58.32	28.8	32.8	25.4	72	21	WSW, SW	320.2	6	Ci., Ci.-S.	NE	Cu.	SW		○ p.
10.	57.95	28.8	33.1	25.1	67.5	19.7	WSW	221.8	7.3	Ci.-S.		Cu.	SW		○ p.
11.	57.32	29.3	34.4	25.1	66.3	19.8	WSW	251.5	3.2	Ci., A.-Cu.		Cu.-N.	W		○ a. d p.
12.	57.06	28	32.4	24.5	74.8	20.7	WSW	279.5	8.8	Ci.-S.		Cu.	WSW	3.6	○ a. d p.
13.	56.65	26	29.9	23.6	86	21.5	WSW	256.5	10	Ci.-S.		Cu.-N.	WSW	4.9	○ a. d p.
14.	55.76	27.7	31.9	24.9	78.5	21.5	WSW	505.1	10	Ci.-S.	S	Cu.-N. W, WSW		.8	○ a. d p.
15.	55.13	29.1	32.9	27.1	67.7	20	WSW	473.6	9.5	Ci.-S.		Cu.-N.	W		○ a. p.
16.	57.06	27.9	33	24.1	77.3	21.4	Variable	131.1	9.7	Ci.-S.		Cu.-N.	W		○ p.
17.	58.71	27.3	32.6	23.9	80.5	21.5	Variable	137.3	9	Ci.-S.	WNW	Cu.	W		○ p.
18.	58.31	26.7	32.6	23.5	83.2	21.5	Variable	118.7	5.3	Ci.	S	Cu.-N.	W	.5	○ a. 1/2 p.
19.	57.10	26.4	31	24.1	82.2	20.9	SW quad.	184.4	8	Ci.-S.	E	Cu.-N.	W	31.8	○ p.
20.	56.87	28.6	33	25	73.3	21.3	SW quad.	226.2	8.7	Ci.-S.	S	Cu.-N.	W	2.8	○ a. 1/2 p.
21.	57.31	27.4	31.8	23.6	78.3	21.2	WSW	235.9	8.5	A.-Cu.	S	Cu.-N.	W	2.5	○ a. 1/2 p.
22.	57.33	27.7	31.5	25.5	75.7	20.9	SW, WSW	351.1	9.2	Ci.-S.		Cu.-N.	W	6.1	○ p.
23.	57.28	28.4	33	25.4	72.7	20.7	WSW	385	7	Ci.	E	Cu.-N.	WSW		○ p.
24.	57.92	27.6	31.7	25.5	73	20	W	302.5	10	A.-Cu.		Cu.-N.	W		
25.	58.88	28.5	32	26.8	71.7	20.6	W, WSW	378	10	Ci.-S.		Cu.-N.	W		
26.	58.05	28.5	32.1	27.1	71.5	20.6	WSW	434.9	8.5	Ci.-S.		S.-Cu	W		
27.	56.31	28	32.1	25.8	70.3	19.8	WSW	481.6	9.3	A.-Cu.	SW	S.-Cu.	WSW		○ d° p.
28.	56.45	27.7	30.3	25.2	70.7	19.5	W, WSW	434.8	10	Ci.-S.		Cu.-N.	WSW	1.3	○ d° p.
29.	58.38	25.9	29.1	23.6	78.5	19.4	WSW	303.6	8.5	Ci.-S.		Cu.-N.	W	11.4	○ p.
30.	58.12	27.2	30.6	25.8	74.3	19.7	W, WSW	339.8	8.7	Ci.-S.		Cu.-N.	W		○ a. p.
31.	57.09	26.2	29.1	24	81.8	20.6	WSW	326	9.7	Ci.-S.		Cu.-N.	W	7.9	○ a. p.
Mean	757.38	28	32.3	25.3	73.9	20.6			316.4	7.8					
Total								9,809.2						73.6	

\* All the mean values given in these tables are deduced from six daily observations.

\* From 1st to 5th, the minimum temperatures are taken from a self-registering apparatus owing to the ordinary minimum thermometer being defective.

## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1..	757	28.6	30.4	26.4	65.3	19	SW	581	5	Variable.	Cu. W quad.		☉ ☉ a.
2..	57.28	28.4	32.1	26.4	69	19.9	SW quad.	556.8	5.5	Ci., A.-Cu.	Cu. SW, WSW		☉ a. < p.
3..	57.76	28.3	30.6	25.8	74	21.1	SW	509.6	3.7	Ci., A.-Cu.	Cu. WSW		☉ a.
4..	57.58	29.1	30.5	26.9	70.5	21.2	SW	590.6	3.7	A.-Cu.	Cu. WSW		☉ a.
5..	57.44	27.8	29.9	25.6	75.2	20.9	SW	630.3	6.5	A.-Cu.	Cu. WSW	2.3	☉ a. ☉ a. p. < p.
6..	57.60	27.8	30	25.8	74.8	20.7	SW	734.1	6.7	Ci.-S.	Cu. SW	1	☉ a.
7..	58.10	27	29.9	23.1	75.5	20	SW	508.4	5	Ci., Ci.-S.	Cu. SW	9.7	☉ a. ☉ p.
8..	58.27	28.4	30.2	26.4	73.2	21.1	SW	493.4	2.8	Ci.	Cu. SW		☉ a.
9..	58.54	28.9	32.3	26.8	62.8	18.4	SW quad.	539.6	5.3	Variable.	Cu., S.-Cu. SW		☉ a. ☉ a.
10..	58.03	28.3	31	26	68.7	19.6	SW	544.3	4.7	Ci.-S.	Cu. W		☉ a. ☉ p.
11..	57.28	28.4	30.6	26.5	68.8	19.8	SW	578.1	2.8	Ci.	Cu. WSW		☉ a. ☉ p.
12..	57.14	27.7	30.5	25	74.2	20.4	SW quad.	450.2	5.2	Ci.	Cu. W		☉ a. ☉ p.
13..	57.03	27.4	30	25	75.2	20.4	SW quad.	266.7	8	Ci.-S., Ci.	Cu. W	.8	☉ a. ☉ p.
14..	56.39	28.5	33	26.1	67.2	19.3	SW quad.	516.5	6.7	Ci.-S.	Cu. W		☉ a.
15..	55.22	28.1	30.1	25.2	71	20.1	SW	807.7	7	Ci.-S.	Cu., Cu.-N. SW	3.3	☉ a. ☉ p.
16..	57	27.3	30	23.1	79.5	21.3	SW	631.7	7	Ci.-S.	Cu., Cu.-N. SW	7.4	☉ a. ☉ p.
17..	58.56	28.2	32.1	25.5	77.7	21.9	Variable	254.8	6.3	Ci.-S.	Cu. SSW	.5	☉ a.
18..	58.52	27.7	30.6	24.5	78.3	21.5	Variable	231.8	5.3	Ci.	Cu. NNE	26.4	☉ a. ☉ a. < p.
19..	57.63	26.4	28.5	22.5	80.3	20.4	SW	471.5	6.8	Ci., Ci.-S.	Cu. NNE	8.7	☉ a. ☉ a. p. p.
20..	57.04	28	30.2	25.5	73.5	20.6	SW	521	6	Ci.-S.	Cu. WSW	.8	☉ a. ☉ a. p.
21..	57.44	28	30	26	71.3	20	SW	470.3	5.7	Ci.	Cu., Cu.-N. SW		☉ a. ☉ a. p.
22..	57.38	27.4	29.4	25.6	74.5	20.3	SW	593.8	6.5	Ci.	Cu. SW		☉ a. ☉ a. p.
23..	57.39	28	30.6	25.4	71	20	SW	644.5	6	Ci.-S.	Cu. SW		☉ a.
24..	58.14	26.9	29.9	23	73.3	19.2	SW	474.3	6.8	Ci.-S.	S.-Cu. WSW	7.9	☉ a. ☉ a. p.
25..	59.22	28.1	30.4	24.3	68.2	19.3	SW	502.2	7.7	Ci.-S.	S.-Cu. SW		☉ a. ☉ a. p.
26..	58.38	28.1	31.6	26	68.5	19.4	SW	491.6	7.2	A.-Cu.	S.-Cu. wsw, sw		☉ a.
27..	56.61	26.8	28.2	25.2	75.8	19.9	SW	689.6	7.8	Ci.-S., A.-Cu.	Cu., Cu.-N. wsw	2.1	☉ a. ☉ a. ☉ p.
28..	56.63	26	28	24.4	77.8	19.6	SW	733.4	8.3	A.-Cu.	Cu.-N. SW	3.1	☉ a. p.
29..	58.39	27.4	30	25.3	72.2	19.6	SW quad.	551.8	7.5	A.-Cu.	S.-Cu., Cu.-N. sw		☉ a.
30..	58.48	26.1	29.3	22.5	76.2	19	SW	451	7.8	A.-Cu.	S.-Cu., Cu.-N. w	8.1	☉ a. a. ☉ a. p.
31..	57.66	26.4	31	23.7	78.7	20	SW	329.1	6.3	Ci.-S., A.-Cu.	Cu., Cu.-N. W	1.1	☉ a. a. ☉ a. p.
Mean	757.58	27.7	30.4	25.1	73	20.1		527.4	6.1				
Total								16,349.7				83.2	

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	757	27.6	30	25.9	79.8	22	SW	405.2	8.5	Ci.-S., Ci.	Cu.-N.		72.3	d a. ● ↙ p.
2.	57.32	27	29.6	22.4	83.3	21.9	SW	349.6	9.8	Ci.-S.	Cu.-N., Cu.		26.7	☐ a. ● <sup>2</sup> a.
3.	57.98	27.8	30.5	24.3	83	23.1	SW	311.3	7	Ci.-S.	Cu.		1	● a.
4.	57.64	28	30.5	26.4	81.3	22.8	SW	367.9	6.7	Ci.	Cu.		17	d p.
5.	57.19	26.4	29.5	22.8	86	21.9	SW	431	9.5	Ci.-S.	Cu.	SW	101.6	● a. p. ↙ ☐ a. p.
6.	57.80	25.4	27	22.9	90.2	21.8	SW	360.3	9.8	Ci.-S.	Cu.-N.		39.4	● a. p.
7.	58.09	25.7	28.3	23.4	86	21	SW	293.3	8.7	Ci.-S.	Cu.-N.		8.8	● a. p.
8.	58.28	27.2	29.4	24.6	81	21.8	SW	311.1	6.5	Ci.	Cu.			
9.	58.51	26.5	28.9	24.5	80.5	20.6	SW	427.6	6.8	Ci.	Cu.	SW		d a.
10.	58.06	27.8	30.5	26.2	78.2	21.8	SW	407.5	6	Ci.	Cu.			
11.	57.31	27.4	30	25.1	78.2	21.1	SW	376.7	5.3	Ci.	Cu.			
12.	57.24	26.8	29	24.4	86.3	21	SW	308.1	6.7	Ci.	Cu.	SW	10.2	● a.
13.	56.91	26.4	28.9	24.4	82.2	21.6	SW	250.2	10	Ci.-S.	Cu.			d a. p. ↙ p.
14.	56.41	26.4	28.6	23.8	79.5	20.1	wsww, sw	231.2	10	Ci.-S.	Cu.-N.			d p.
15.	55.25	26.2	29.4	22.9	82.3	20.7	SW	383.3	10	Ci.-S.	Cu.-N.		36.4	● d ↙ p.
16.	56.80	26.5	29.8	24.6	83	21.3	SW	300.7	10	Ci.-S.	Cu.-N.		5	● a.
17.	58.59	26.8	30.8	23	79.7	20.6	NE	126.6	9.3	Ci.	Cu.		19.8	● a. p.
18.	58.50	26.7	31.5	23	84.7	21.8	Variable	172.7	8.8	Ci.-S.	Cu.		4.5	● a. p. ↙ p.
19.	57.11	27.1	30.1	24.9	86.2	22.8	SW	200.1	8.7	Ci.-S.	Cu., Cu.-N.		1	● a. p. ↙ p.
20.	57.12	26.6	29.1	25.1	84.5	21.8	SW	308.7	7.5	Ci., Ci.-S.	Cu.		2	● a. d a. p. ↙ p.
21.	57.40	26.5	29.2	24.6	82.3	21.8	SW	299.1	8	Ci.-S.	Cu.-N.	SW	6.1	d a. ● ↙ p.
22.	57.38	26.4	29.1	24.1	85.2	21.5	SW	290.7	8.8	Ci.-S.	Cu.		25.4	● a. p. d p.
23.	57.73	25.2	27.1	22.5	90.2	20.4	SW	307.1	10	Ci.-S.	Cu.-N.		43.7	● a. p.
24.	58.34	25.2	27	22.3	85.7	20.4	SW	353.1	9.3	Ci.-S.	N.		9.3	● a. p.
25.	59.37	26.5	29	23.3	81.3	20.8	SW	361.8	9.8	Ci.-S.	Cu., Cu.-N.			● ↙ p.
26.	58.28	26.8	29.1	24.1	82.8	21.7	SW	343.7	10	Ci.-S.	Cu.-N.		20.6	● ↙ p.
27.	56.31	25.6	28	22	86.8	21.1	SW	427.4	10	Ci.-S.	Cu.-N.	SW	65	● a. p. ● <sup>2</sup> p.
28.	56.34	24.8	26.5	22	89.5	20.8	SW	427.9	10	Ci.-S.	Cu.-N.		40.7	● a. p.
29.	58.24	26.7	29.1	22.6	79.3	20.6	SW	367.2	9	Ci.-S.	Cu.-N.	SW	1	d ● <sup>2</sup> p.
30.	58.50	26.4	30	24.5	83.3	21.2	SW	274.4	8.2	Ci.	Cu.		1.5	d ● <sup>2</sup> p.
31.	57.68	25.9	30	23	82	20.2	S quad.	170.4	8	Ci.-S.	Cu.-N.		2.3	● ↙ p.
Mean	757.57	26.5	29.2	23.8	83.2	21.4		320.8	8.6					
Total								9,946.3					556.8	

<sup>a</sup> From 15th, 6 p. m. to 23d, 2 p. m., these values were taken from a self-registering apparatus, as the ordinary thermometer was broken.

*Meteorological data for first and second class stations—Continued.*

**ORMOC.**

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied,  $-1.83$  mm.]

[illegible]

**TACLOBAN.**

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).		Form and its direction.					
										Upper.		Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.					mm.	
1.	756.69	27.4	31.3	24	81.2	21.6	WNW	1.3	7.8	Ci.	NE	Cu.-N.	WNW	2.6	☉ a. ☉ a. p. ● p.
2.	56.84	28	33.5	24	78.7	21.6	WNW	1.3	8	Ci.	NE	Cu.-N.	WNW		
3.	57.40	28.3	32.8	24.5	73.2	20.6	WNW	1.3	5.7	Ci.-Cu.	N	Cu.	W		
4.	57.14	28	34	24	75.5	20.7	W		4.8	Ci.-Cu.	NE	Cu., Cu.-N.	W	3.8	☉ a. ● p.
5.	56.90	26.9	32.2	23.6	82	21.3	W	1.8	7	Ci.-S.		Cu.-N.	W	1.1	d ☉ ● p.
6.	56.96	27.7	33	23.4	78.2	21.1	WNW	1	7.7	Ci.-S.	ENE	Cu.	WSW		
7.	57.52	28.4	33.2	24.2	75.5	21.5	NW	1	5.5	Ci.-S.		Cu.	WSW	.3	☉ a. d p.
8.	57.82	27.7	32.5	23	79.3	21.6	WNW	.8	5	Ci., Ci.-S.	ENE	Cu.	WSW		
9.	57.94	28.1	32.7	24	79.3	22.2	WNW	.8	6.2	Ci.-S.		Cu.-N., Cu. wsw		27.4	☉ a. ☉ a. p.
10.	57.67	28	31.5	25	74.5	20.6	NW	1.2	7.7	Ci., Ci.-Cu.	ENE	S.-Cu.			☉ a. ☉ a. p.
11.	57.01	28	34	23.5	78.5	21.5	WSW	.8	6.3	Ci.	ENE	Cu.	W		☉ p.
12.	56.85	26.6	33.5	23.5	86.3	22.2	ESE, S	.3	7.7	Ci.	ENE	Cu.	W	17	☉ p.
13.	56.93	25.2	27	23	92.2	21.9	WNW	1.3	9.8			N.	NW	11.8	d ☉ a. p. ☉ p.
14.	55.66	26.3	29.8	24	83.8	21.3	WNW	2.5	9.7	Ci.		Cu.-N.	NW	6.1	☉ a. p. ☉ a. p.
15.	54.44	28.3	33	24.2	74.7	21.2	SW quad.	1	8.3	Ci.	NE	Cu.-N.	W quad.		☉ a. p. ☉ a. p.
16.	57.01	27.5	31	24.8	78.7	21.3	S quad.	.8	7.7	Ci.	NE	Cu.-N.	SW	.3	☉ a. p. ☉ a. p.
17.	58.88	26.8	31.5	24.4	85.8	22.3	ESE	.8	8.5	Ci., Ci.-Cu.		Cu.-N.	W S	.5	☉ a. p. ☉ a. p.
18.	58.40	26.4	32	24	88.2	22.2	WNW, W	.8	6	Ci.-S.	W	Cu.	ENE, E	4.3	☉ a. p. ☉ a. p.
19.	56.80	26.8	32	23.4	86.2	22.2	Variable	.8	7.5	Ci.-S.	NW	Cu.	ESE, SE	8.7	☉ a. p. ☉ a. p.
20.	56.68	26.8	31.3	24.2	84.8	22	NW	.8	8.2	Ci.-S.	NW	Cu.-N.	NE, NNE	3.8	☉ a. p. ☉ a. p.
21.	57.23	25.8	30.6	23	88.7	21.6	E, W	.3	8.2	Ci.-S.	NW	Cu.-N.	NE	.5	☉ a. p.
22.	57.13	26.6	31	23	86.8	22.3	W	.8	8.2	Ci.-S.	NW	Cu.-N.	SW	1.3	☉ p.
23.	56.97	27.4	32	23.8	82.5	22	WNW	.8	8.2	Ci.-Cu.	NW	Cu.	SW	9.7	☉ p.
24.	57.71	26.4	31.4	24.8	85.3	21.8	ESE, W	.3	8.3	Ci.-S.		Cu.-N.	WSW	1	☉ p.
25.	58.80	26.8	31	23.1	78.3	20.4	WNW	1.8	7.5	Ci.-S.	NW	Cu.-N.	WSW	5.6	☉ p.
26.	58.06	27.4	31.2	23.2	77.7	20.9	WNW	1.5	7.5	Ci.	NE	Cu., Cu.-N.	W		
27.	55.81	27.5	33	24.4	82.7	21.8	W	.5	8	Ci.-Cu.	E	Cu.	W	13.2	☉ p.
28.	56.19	26.5	33	24.2	80.7	20.6	SSW	.8	8.3	Ci.		Cu.-N, W, WSW			
29.	57.92	26.9	30.7	24	76.7	19.9	SSW	.5	7.5	Ci.-Cu.		Cu., Cu.-N.	W	2.8	☉ p.
30.	58.02	27.1	30.5	24.6	76.5	20.2	WNW	1.7	7	Ci.-S., Ci.	E	Cu.-N.	WNW		
31.	57.28	24.8	27.5	22.3	89	20.7	WNW	2.3	8.7	Ci.	E	N.	NW quad.	36.8	☉ a. ● p.
Mean	757.18	27.1	31.7	23.8	81.3	21.4		1	7.5						
Total														158.6	



**CAPIZ.**

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied,  $-1.81$  mm.]

Day.	Pressure (mean).			Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Amount (mean).	Form and its direction.						
										Upper.	Lower.					
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.		
1.	756.91	25.9	33.2	23.6	87.2	21.5	S quad.	107.6	6.7	Ci., Ci.-S.	N.	SW	5.4	☽ d° ☽ p.		
2.	57.09	26.9	33.2	23.6	83.5	21.8	Variable	74.3	8.2	Ci., Ci.-S.	N.	SW	-----	d° a. ☽ p.		
3.	57.61	27.5	34.1	23	81.2	21.7	Variable	99.6	4.5	Ci.	Cu.	W	-----	☽ p.		
4.	57.46	27.3	34	23.4	81.5	21.6	W quad.	144.3	5.3	Ci.-S.	Cu.	W	8	☽		
5.	57.43	25.2	27.5	23.8	92.3	21.9	W, WSW	144	10	Ci.-S.	Fr.-N.	W	9.2	☼ a. ☽ p.		
6.	57.41	24.7	27	23.7	94.3	21.8	W	105.1	8.5	Ci.-S.	N.	W	6.2	☼ a. d° p.		
7.	57.87	25.3	31.6	22.6	90.5	21.6	SW, S	134.9	6.7	Ci.-S.	Fr.-N.	SW	44.7	d° a. ☽ p.		
8.	58.08	25.8	31.5	23	91.5	22.4	SW	82.5	8.3	A.-Cu.	Cu.	S	10.5	☼ a. ☽ p.		
9.	58.09	27	33.6	23	82	21.4	S, NW	85.4	5	A.-Cu.	Cu.	S	-----	☼ a. ☽ p.		
10.	57.98	27.3	33.4	23.6	79.7	21.1	W	135.8	5.3	Ci.-S.	Fr.-N.	W	-----	☼ a. ☽ p.		
11.	57.22	26.3	33.2	23.5	82.8	20.9	SW, NW	92.8	6.3	Ci.	Cu., Fr.-N.	SW	-----	☼ a. ☽ p.		
12.	57	26.6	33.3	23.1	85.2	21.8	Variable	107.2	7	Ci.-S.	N.	-----	☼ a. ☽ p.			
13.	56.95	25.8	29.9	23.4	88.8	21.8	NW	44.8	9	Ci.-S.	N.	-----	☼ a. ☽ p.			
14.	56.49	25.8	29.5	23.4	87.5	21	W	98.8	9.7	Ci.-S.	Fr.-N.	NW	1.8	d a. p.		
15.	54.81	25.5	32.8	23	89.2	21.5	W, SSW	112.1	9.5	Ci.-S.	N.	SW	1.3	☼ a. d° p.		
16.	56.24	26.2	33.6	23.4	87.5	22	SW	170.9	9.7	Ci.-S.	N.	SW	6.1	☼ a. ☽ p.		
17.	58.71	26.2	31.4	22.6	88.2	22.2	S, ENE	73.6	7.7	Ci.	Fr.-N.	NE	-----	☼ a. ☽ p.		
18.	58.74	27.6	32.4	25.5	86.7	23.6	N quad.	120	7	Ci., Ci.-S.	N.	NE	-----	☼ a. ☽ p.		
19.	57.11	27.8	33.6	24.5	85.7	23.6	NW	119	6.5	Ci.	Cu.	NW	3.8	☼ a. ☽ p.		
20.	56.83	26	31.5	23.4	90.2	22.4	S	113.4	8.8	Ci.-S.	N.	SW	20.3	☼ a. ☽ p.		
21.	57.32	25.1	33.3	23.5	91.8	21.6	S, SW	82	8.5	Ci., Ci.-S.	N.	SW	10.2	☼ a. ☽ p.		
22.	57.17	25.8	32.8	23.1	89.3	21.9	SW	106.7	8.5	Ci.	N.	SW	8.2	☼ a. ☽ p.		
23.	57.31	25.4	30.5	22.9	90.8	21.8	SW, W	97.6	9	Ci.-S.	Fr.-N.	SW	6.7	d° a. p.		
24.	58.06	26.2	32.2	23.6	85	21.3	S	94.7	8.8	Ci.-S.	Fr.-N.	SW	1.6	d° a. d° p.		
25.	59.30	26.1	31.9	23.5	84.7	21.1	NNE	107.3	9.7	Ci.-S.	N.	W	1.3	☼ a. d° p.		
26.	58.27	26.5	32.3	23	82.8	21	N	87.6	7.8	Ci.-S.	N.	SW	1.5	☼ a. ☽ p.		
27.	55.80	25.8	31.7	22.9	84.3	20.6	W	121.8	9.2	Ci.-S.	N.	SW	1.8	☼ a. ☽ p.		
28.	55.73	26.2	31.8	23	83.5	20.8	SW quad.	143.8	8.3	Ci.-S.	N.	SW	-----	☼ a. ☽ p.		
29.	57.99	27.1	32.3	23.5	80.3	21.2	SW quad.	102.3	8.7	Ci.-S.	N., Fr.-N.	SW	.5	☼ a. ☽ p.		
30.	58.32	26.8	32.5	23.4	81	20.9	Variable	133	6.8	Ci.-S.	N.	S, W	-----	☼ a. ☽ p.		
31.	57.75	26.5	32.7	22.8	81.5	20.6	NW	137.7	6.8	Ci.-S.	Cu., N.	-----	-----	☼ a. ☽ p.		
Mean	757.39	26.3	32	23.4	86.1	21.6	-----	-----	109.1	7.8	-----	-----	-----	-----	-----	
Total	-----	-----	-----	-----	-----	-----	-----	-----	3,380.6	-----	-----	-----	-----	141.9	-----	

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.80$  mm.]

Day.	Pressure (mean).			Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. of.	mm.		Km.	0-10.				mm.		
1.	756.70	27.3	30.9	23.6	82.3	22.1	W	322.6	8.5	Ci.-S.	S.-Cu.	W	6.6	p ●° p.	
2.	57.07	27.7	30.2	26.8	82.5	22.8	SW	365.9	6.7	Ci.-S.	N.	SW	-----	d° a. $\searrow$ p.	
3.	57.36	28.1	31.2	25.2	80.2	22.6	WSW	315.8	6.3	A.-Cu.	N.-Cu.	WSW	-----	p p.	
4.	57.22	28.1	31.1	25.6	82.7	23.3	SW	344	5.7	A.-Cu.	N.-Cu.	SW	1.8	p p.	
5.	56.92	27.8	31.1	26.2	81.6	22.8	SW	437.4	5.7	Ci.-S.	N.-Cu.	SW	2.5	●° a.	
6.	57.12	27.5	29.4	26.2	82.7	22.4	SW	535.8	5.8	Ci.-S.	N.-Cu.	SW	1.5	●° a.	
7.	57.64	27.5	31	24.9	79.7	22.4	SW	408.7	7.2	Ci.-S.	N.-Cu.	SW	-----	-----	
8.	57.99	28.4	31.3	25.3	79.5	22.8	SW	328.9	6.3	Ci.-S.	N.-Cu.	SW	1.3	p° a. $\cup$ p.	
9.	58.08	28.2	31.6	25.6	80.7	22.9	SW	354.2	6.7	Ci.-S.	N.-Cu.	SW	-----	$\cup$ p.	
10.	57.61	28.2	31.2	26.4	79.7	22.5	SW	343.6	7.2	Ci.-S.	N.-Cu.	SW	-----	$\cup$ p.	
11.	57.13	28.1	33	24.2	79.7	22.5	SW	280.3	7.3	Ci.-S.	N.-Cu.	SW	-----	$\cup$ p.	
12.	56.85	28.3	33.6	23.8	79.8	22.7	WSW	277.6	7.7	Ci.-S.	N.-Cu.	WSW	2.5	●° d° a. p.	
13.	56.77	26.2	27.4	25	90.2	22.7	W quad.	169.3	9.7	Ci.-S.	N.	W	8.4	d° a. p.	
14.	55.66	26.1	29.8	24	85.5	21.5	W	271.7	10	Ci.-S.	N., S.-Cu.	WNW	4.8	d° a. p° p.	
15.	54.33	27.1	28.9	25.6	82.5	22	SW quad.	526.4	10	Ci.-S.	S.-Cu.	SW	1.3	d° a. p° p.	
16.	56.80	27.2	30.3	24.2	81.3	21.6	SSW	312.5	9.8	Ci.-S.	S.-Cu.	SW	3.8	$\nwarrow$ d p.	
17.	59	26	31.8	24.1	87.5	21.7	N	-----	8.2	Ci.-S.	Cu.-N.	E, ENE	5	$\nwarrow$ $\cup$ p.	
18.	58.52	25.6	30.2	22.8	91.3	22.1	Variable.	-----	7.3	Ci.-S.	S.-Cu.	Cu.-N., N.E.N.	17	●° a. $\cup$ d p.	
19.	56.87	27	31.1	22.8	84.3	22.2	SW	-----	6.3	Ci.-S.	S.-Cu.	SW	-----	$\nwarrow$ p.	
20.	56.73	28	32.9	25.5	79.8	22.3	SW	-----	8	Ci.-S.	S.-Cu.	WSW	3.6	●° a. p° p.	
21.	57.12	27.5	30.2	24.2	82.7	22.6	SW	-----	7.5	Ci.-S.	Cu.-N.	WSW	6.4	$\nwarrow$ p.	
22.	56.94	28.1	30.7	25.9	80.5	22.6	SW	295.8	6.8	Ci.-S.	S.-Cu.	SW	3.6	$\nwarrow$ p.	
23.	57.05	27.8	30.6	25.2	80.8	22.2	SW	409	7.5	Ci.-S.	Cu.-N.	SW	-----	p° a.	
24.	57.77	28.1	31	26.7	79.8	22.5	SW	-----	7.7	Ci.-S.	S.-Cu.	SW	18	-----	
25.	58.98	27.8	31.9	24.2	80.2	22.1	SW	-----	8.3	Ci.-S.	S.-Cu.	SW	1.5	●° a. p° p.	
26.	58	27.7	30.3	24.8	79.7	21.9	W quad.	-----	8	Ci.-S.	S.-Cu.	WSW	-----	-----	
27.	55.84	27.3	30.7	23.8	81.3	21.8	SW	-----	7.5	Ci.-S.	S.-Cu.	SW	-----	-----	
28.	56.09	27.7	29.7	25.7	78.5	21.6	SSW	-----	8.2	Ci.-S.	S.-Cu.	SW	-----	p° a.	
29.	57.97	27.7	30.2	26.7	81.2	22.4	SSW	-----	7.5	Ci.-S.	S.-Cu.	SSW	13.2	-----	
30.	58.24	26.9	30.6	23.7	84.8	22.2	W quad.	169.7	7.8	Ci.-S.	S.-Cu.	W	4.1	●° a. $\searrow$ p.	
31.	57.21	26.6	30.4	23.7	86.5	22.3	NW	172.8	8.3	Ci.-S.	S.-Cu.	WNW	.8	●° a. $\nwarrow$ $\searrow$ p.	
Mean	757.21	27.5	30.8	24.9	82.3	22.3	-----	332.2	7.8	-----	-----	-----	-----	-----	
Total	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	101	-----	

*Meteorological data for first and second class stations—Continued.*

LEGASPI.

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer bove sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. et.	mm.		Km.	0-10.				mm.	
1.	756.21	26.3	30.6	24.4	89	22.5	WSW	288.3	6.5	Ci.-S.		Cu., Cu.-N.	34	☐ ☐ ☐ d p.
2.	756.57	27	30	24.5	85	22.5	WSW	283.3	9	Ci.-S.		Fr.-N., Cu.	6.1	● a. d° p.
3.	757.13	27.6	32.9	24.6	80.2	21.6	WSW, W	226.1	3.5	Ci., A.-Cu.	W	Cu.	3.3	d° a.
4.	756.82	26.6	31.9	24.3	83.7	21.6	WSW, W	267.6	5.2	A.-Cu.		Cu.	3.3	● a. p.
5.	756.23	26.2	29.6	24.3	86.5	21.6	WSW	306.8	8.3	Ci.-S.		Cu.-N.	13.3	d° a. < p p.
6.	756.46	25.6	26.9	24.3	90.7	21.6	WSW	329.3	9.3	Ci.-S.		Fr.-N.	15.5	● a. p.
7.	756.95	26.8	31	24.3	83.7	21.7	WSW	329.3	4.3	Ci.-S.		Cu.-N.	1	d° ● a. p.
8.	757.37	28	32.2	24.9	79.3	21.7	WSW, W	327.8	5.7	Ci.-S.		Cu.		
9.	757.43	27.8	32.1	24.3	79.3	21.7	W, WSW	362.9	3.7	Ci.-S.	NE	Cu.		
10.	757.04	27.7	33	24.4	79.5	21.8	W, WSW	301.3	7.5	Ci.-S.		Cu.		○ p.
11.	756.67	27.2	31.1	24.7	82.5	22	WSW	245.4	6.5	Ci.-S.	ENE	Cu.		
12.	756.34	27.2	31.9	24.5	82.7	22	W, WSW	242.8	4.7	A.-Cu.	NE	Cu.	17.5	● a. p.
13.	756.26	26.7	30.9	23.9	85.3	22.1	WSW	230.7	7	Ci.-S.		Cu.-N.	31.6	d° ● a. p.
14.	755.48	25.3	27.4	22.6	88.7	21.1	W	381.8	10	Ci.-S.		Fr.-N.	5.4	● d. a. ● p.
15.	753.32	26.8	29.2	24.6	84	21.8	WSW	331.8	10	Ci.-S.		Cu.-N.	2.1	● a. p.
16.	755.75	27.4	33.5	23.9	78.8	21.1	W, WSW	335.2	9.2	Ci.-S.		Cu.-N.	3.8	d° ☐ d° ● p.
17.	758.95	26.7	30.6	23	84.3	21.8	W	80	7.8	A.-Cu.	SE	Cu.		☐ p.
18.	758.46	28.3	33.9	24	79.7	22.6	N, NNE	175.2	5	Ci.		Cu.	3	● p.
19.	756.53	28	33.8	24.4	82.5	22.9	NE	96.8	5.7	Ci.		Cu.	13.9	d° a. ☐ p.
20.	756.53	26	30.1	24.2	89.3	22.4	WSW	221	9.8	Ci.-S.		Fr.-N.	1.3	● a. ● p.
21.	756.66	27.1	31.6	23.6	82.2	21.7	WSW	217.9	4.8	Ci.-S.		Cu.	1.5	d a. ● a. p.
22.	756.52	26.7	31.7	24	85.2	22	WSW	222.3	3.7	Ci., Ci.-S.		Cu.	1.1	● a. ☐ p.
23.	756.70	26.2	29.7	24	88.2	22.3	W, WSW	231.3	6	Ci.-S.		Cu.-N.	10.2	d° a. ● a. p.
24.	757.38	26.8	30.6	24.5	83.2	21.6	W, WSW	239.2	6.8	Ci.-S.		Cu.-N.	22.9	● a. p.
25.	758.56	27.2	31.8	24	78.2	20.8	WSW	302.1	8.3	A.-Cu.	W	N.	5.6	● d. a.
26.	757.50	26.9	31.6	24.5	82.3	21.6	W, WSW	240.5	4.3	Ci.-S.		Cu.-N.	2.6	d a. ● p.
27.	755.13	26.8	29.9	24.2	81.3	21.2	WSW	309.1	4	Ci.-S.		Cu.-N.	1.3	● a. d° p.
28.	755.26	26.5	30.8	23.6	81.7	20.9	WSW	265.4	5.3	Ci.-S.		Variable		● d° a.
29.	757.62	26.9	31.7	24.4	83	21.7	WSW	250.7	6.7	A.-Cu.	N	Fr.-N.		d° a.
30.	757.92	27.1	32.9	24.2	80.7	21.2	WSW	223.2	5	Ci.	S	Variable	.8	☐ a. ☐ p.
31.	757	26.4	32.6	23.6	84.5	21.4	W	178	7.8	Ci.-S.	E	Cu.-N.		d° p.
Mean	756.73	26.9	31.2	24.2	83.4	21.8		258.2	6.6					
Total								8,003.1					195.1	

ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.			Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. et.	mm.		Km.	0-10.				mm.	
1.	755.96	26.6	29	23.9	84.5	21.8	W	180	8.3	A.-Cu.	S	S.-Cu.	W	∠° p.
2.	56.57	26.9	30.2	24.7	75.8	19.9	SW, W	237.2	8.5	A.-Cu., Ci.-S.		S.-Cu.	W	∠° p.
3.	56.94	26.4	31.1	22.7	79	20	SW, W	237.1	8.3	Ci.-S.		S.-Cu.	W	7.7
4.	56.33	26.8	30	22.3	84.3	21.2	SW, W	236.6	9.8	Ci.-S.		Fr.-N., S.-Cu.	W	4.4
5.	55.86	25.6	28.6	22.8	84.2	20.5	SW	362.3	9.5	Ci.-S.		S.-Cu.	W quad.	d° a. p.
6.	55.81	26.6	29.4	24.7	81.2	21	SW	385.9	9.5	Ci.-S.		S.-Cu.	W quad.	d° a. p.
7.	55.88	27	30.6	24.8	76.8	20.3	SW	318.7	7.5	A.-Cu.	SW	S.-Cu.	SW, W	d° p.
8.	56.89	27.6	32.2	23.9	77.2	21	SW quad.	325.8	7.8	A.-Cu.	SW, NE	S.-Cu.	W	∠ p.
9.	56.99	28.4	32.7	25.6	72	20.6	SW	316.4	4.7	Ci.	NE	Cu., S.	W	∠ p.
10.	56.60	28.8	34	25.6	69.5	20.3	sw, wsw	333.1	8.2	A.-Cu.	NE	S.	W	∠ p.
11.	56.04	27.5	31.2	24.4	77.8	20.7	SW	303.5	9.2	Ci.-S.		S.-Cu., S.	W	∠ p.
12.	56.05	26.8	32.4	23.5	79.8	20.3	SW	192.3	7.7	A.-Cu.		Cu.	SW, W	12.5
13.	56.18	25.9	30.7	22.8	88.3	19.9	SW	183.9	9.2	Ci.-S.	E	S.-Cu.	W	14.4
14.	56.01	25.8	28.9	23.5	89.3	22.1	SW quad.	142.1	10	Ci.-S.	NE	Fr.-N. NW, NW	W	2.8
15.	52.98	27.8	32.3	24.2	75.5	20.8	SW	276.3	10	Ci.-S.	NE	S.-Cu.	W	13
16.	54.59	25.9	27.2	24.3	86.5	21.4	SW quad.	345.9	10	Ci.-S.		N.	SW	1.8
17.	58.64	26.6	30	25	88.8	20.8	E quad.	182.5	10	Ci.-S.		S.-Cu.	SE, SSE	11.1
18.	58.98	27.6	30	25.2	86.2	23.6	NE, N	337.8	8	A.-Cu.	E	S.-Cu.	NE quad.	3.6
19.	56.76	27.6	31.8	24.4	81.3	22.6	W quad.	210.3	4.8	Ci.	E	S.-Cu.	N	1
20.	56.14	26.5	28.9	23.8	88.2	22.6	SW	167.3	9.8	A.-S.	E	S.-Cu.	SW	12.2
21.	56.52	25.9	32.3	23.1	88.2	21.8	SW	241.7	5.2	A.-Cu.	NW	Cu.	SW	∠ p.
22.	56.32	25.8	31.4	22.3	86.8	21.1	S quad.	229.1	5.2	Ci.		Cu.	SW	∠ p.
23.	56.24	26.6	31.9	22.9	82	21.1	SSW, SW	234.3	4.5	Ci.-Cu.	NW	Cu.	SW	∠ p.
24.	56.97	26.5	30.7	23.1	83.8	20.8	S, SW	206.3	7.7	A.-Cu.	W	Cu.	SSW, SW	1.5
25.	58.14	25.7	30.3	22.5	73.7	20.3	SW	210.7	5.8	Ci.	WNW	S.-Cu.	W	30.7
26.	56.96	27.1	31.3	24.4	79	20.8	SW	160.8	5.8	A.-Cu.	W	S.-Cu.	SW	.8
27.	54.03	27	32	27.7	80.3	21.1	SW	168.9	7.8	Ci.-S.		S.-Cu.	SW	∠ p.
28.	54.26	26.1	30.1	24.4	91	22.8	SW		6.7	A.-Cu.	SSE, S	S.-Cu.	S	19
29.	57.11	25.6	31.2	23.8	90.7	22.1	SW		6.8	Ci.		S.-Cu.	SE, W	1.3
30.	57.79	26	31.5	22.5	86.2	21.4	SW	181.8	6.8	Ci.-S.		S.-Cu.	SE, W	∠ p.
31.	57.12	26.7	31.8	22.3	84.2	21.6	SW	219.6	7.8	Ci.-S.	E	Cu., S.-Cu.	NW	63.5
Mean	756.37	26.7	30.9	23.8	82.6	21.3		244.3	7.8					
Total													201.3	

Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5<sup>a</sup> meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.		
1.	756	26.3	29	24.5	90.3	22.9	SSW	1.8	8.8	Ci.-S.	NW	Cu.-N.	W	6.1	● a.
2.	56.92	24.4	26	23	91.7	20.8	WSW	1.3	9.5	Ci.-S.		N.	SW	7.6	● a. ● p.
3.	57.33	25.4	30	22.5	89	21.3	SW	1.5	8.2	Ci.-S.		N.	SW	15.8	d a. ● p.
4.	56.81	25	29.2	22.5	92.8	21.8	WSW	1	10	Ci.-S.		N.	W	12.7	● a. p.
5.	56.11	25	26.2	22.9	94.5	22.1	SSW	1.2	9.7	Ci.-S.		N.	W	16.8	● a. ● p.
6.	56.14	25.7	29.8	23.4	91	22.3	SW	1.7	8.8	Ci.-S.		N., S.-Cu.	W	14.7	● p.
7.	56.17	26.2	30.3	23.5	86.8	21.8	SW	2	8.5	Ci.-S.		S.-Cu.	W	8	d° a.
8.	57.09	26.9	31	24	82.8	21.8	WSW	1.8	8.3	Ci.-S.	NW	S.-Cu.	W	2.3	● a. ● p.
9.	57.37	27.4	31	23.5	81.2	21.8	SW	1.7	7.5	Ci.-S.	NNW, SSE	Cu.	W	2.5	● a.
10.	56.94	28	31.9	24.5	82.5	23.1	WSW	2.5	8.2	Ci.-S.		Variable	SW	10.1	● p.
11.	56.45	27.2	32	24	86.7	23.2	SW	2.2	9.2	Ci.-S.		Cu.-N.	W	1.8	● a. ● p.
12.	56.42	26.6	31.2	22.9	85.7	22	SW	1.3	8.7	Ci.-S.		S.-Cu.	W	22.4	d° p.
13.	56.54	26.5	31.5	22.5	85.2	21.7	SW	1.3	7.7	Ci.-S.		Variable	W	65	● a. p.
14.	56.23	26.3	28.9	23.4	87.2	22.2	Variable	1.3	9.5	Ci.-S.		N.	W	1.4	d° p.
15.	53.70	27.4	31	24.5	81.8	22	WSW	1.7	9.3	Ci.-S.		Cu.-N.	W	22.4	d p.
16.	54.34	25.1	27	23	91.5	21.6	SSW	2.7	9.8	Ci.-S.		N.	SW	65	● a. p.
17.	58.14	26.1	31	22.4	88.3	22	NE	1.2	8.8	Ci.-S.	NNW, WSW	S.-Cu.	SW	1.4	p.
18.	58.79	27	31.8	23	85.5	22.4	E	1.2	5.5	Ci.-S.	NE	Cu.	SE	1.5	● a.
19.	56.82	27.2	34	22.5	83.5	22.1	SE	1.3	6.5	A.-Cu.	NE	Cu., Cu.-N.	SE	1.5	d° p.
20.	56.05	26.2	30.8	23.4	87	21.9	E	1	8.2	Ci.-S.		Cu.-N.	W	1.5	● p.
21.	56.38	27	31.8	23.4	84.7	22.2	WSW	1.7	7	Ci.-S.		S.-Cu.	W	26.9	● a. p.
22.	56.28	26.7	33.8	22.5	84.2	21.7	SW	1.2	5.8	Ci.-S.		Cu.	W	19.6	● a. p.
23.	56.27	26	31	22.1	87.7	21.7	SW	1.3	7.2	Ci.-S.		Cu.	W	4.1	d p.
24.	56.95	26.2	31.7	22.4	85.7	21.5	SW	1.3	7.3	Ci.-S.		Cu.	W	8.6	● a. ● p.
25.	58.34	26.5	30.7	24	86.5	22.1	SW	2.2	8.8	Ci.-S.		Cu.-N.	WSW	19.6	d p.
26.	57	25.5	29.9	24.3	89	21.6	SW	2.3	9.5	Ci.-S.		N.	W	4.1	● a. p.
27.	53.93	26	29.9	24	91	22.7	SW	2.3	8.2	Ci.-S.		N.	WSW	4.1	d a.
28.	54.04	26.6	30.5	24	85.5	22.1	SSW	1.8	8.5	Ci.-S.		Cu.-N.	SW	19.6	● a.
29.	56.85	26.6	31	23	83.5	21.5	SSW	1.3	7.3	Ci.-S.	NW	S.-Cu.	SW	10.2	● a.
30.	57.86	26.5	32.8	22.4	83.5	21.3	SSW	1.5	6.5	Ci.-S.		Cu.-N.	SW	10.2	● a.
31.	57.55	26.4	32.2	23	86	21.8	SW	1	8	Ci.-S.		Cu.-N.	SW	10.2	● a. ● p.
Mean	756.51	26.3	30.6	23.3	86.8	22		1.6	8.2						
Total														249.5	

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	756.08	26.6	33.1	24	88.2	22.6	WSW	151.8	7.3	Ci.-S.		Cu.	WSW, SW	4.6	☉ ☐ a. ● p.
2.	56.34	27.4	31.3	24	82.3	22.2	WSW, SW	220.3	8.7	Ci.-S.		Cu.	SW	3.6	☉ ☐ a. ● p.
3.	57.11	26	32	23.3	85.3	21.8	SW	217.5	8.5	Ci.-S.		Cu.	SW	3.6	☉ ☐ p p.
4.	56.27	26.4	31.3	23.3	83.5	21.1	WSW	278.3	9	Ci.-S.		Cu.	WSW	3.8	☉ p.
5.	55.48	27.2	30.8	24	81.8	21.8	SW	396.1	9	A.-Cu.	SE	Cu.	SW	3.8	d° p.
6.	55.67	27.4	32.1	25.2	81	21.8	SW	365.1	10	Ci.-S.		Cu.	SW	3.8	d° p.
7.	56.19	28	33	24.2	79	21.8	SW	217.1	10	Ci.-S.		Cu.	SW	3.8	d° p.
8.	56.91	28.6	33	25.2	76.7	22	SW	234.7	8	Ci.-S.		Cu.	SW	3.8	d° p.
9.	57.01	28.4	33.5	24.8	76.5	21.6	SW	268.9	6.5	Ci.-S.		Cu.	SW	3.8	d° p.
10.	56.64	28.5	33.3	25	76.8	22.1	SW	260.8	9.2	Ci.-S.		Cu.	SW	3.8	d° p.
11.	56.18	28.1	33.5	25	78.5	22	SW	263.9	7.5	Ci.-S.		Cu.	SW	3.8	d° p.
12.	56.10	28.5	34	24.6	78.7	22.4	SW	236	6.7	A.-Cu.	E	Cu.	SW	3.8	d° p.
13.	56.18	27.5	32.8	24	80	21.5	SW	192.4	8.7	Ci.-S.		Cu.	W, SW	1.3	☉ ☐ ☐ a. ● p.
14.	55.92	25.5	27.3	23	91.3	22.1	SW	178.4	10	Ci.-S.		Cu.	ENE, WSW	6.6	☐ a. ● a. p.
15.	52.63	27.3	30.3	24.9	84.2	22.6	WSW	322.2	10	Ci.-S.		Cu.	WSW	1	☐ a. ● a. p.
16.	54.68	26.3	28.7	24.1	87	22.1	SW	246.3	10	Ci.-S.		Cu.	SSW	3.5	d° a. p.
17.	58.93	26.9	31	23.9	86.3	22.5	NE	119.3	10	Ci.-S.		Cu.	E	3.5	d° a. p.
18.	59.22	27.9	31.7	24.8	87.8	24.4	NE, ENE	184.8	7.2	Ci.-S.		Cu.	NE	9.1	☉ a. d° p.
19.	56.98	26.6	29.9	24.6	91.8	23.6	N, NNW	110.7	10	Ci.-S.		Cu.	N, NNW	38.3	☉ a. ● ☐ p.
20.	56.34	26.7	29.9	24.6	91.5	23.7	W	125.1	10	Ci.-S.		Cu.	W	17.3	☉ a. p. d p.
21.	56.60	26.7	31.5	24	87.3	22.5	SW	147.4	5.5	Ci.-S.		Cu.	W	1.3	d a. p. p.
22.	56.35	26.6	31.8	23.5	87.7	22.5	SW	155.7	4	Ci.		Cu.	WSW	8.4	☉ ☐ p.
23.	56.28	26.5	32.3	24	85.8	22	SW	211.6	4.8	Ci.		Cu.	SW	5	☉ ☐ p.
24.	57.07	27.2	33.5	23.6	85.8	22.8	Variable	146.3	5.3	Ci.-S.		Cu.	SSW	8	☉ a. d ☐ p.
25.	58.22	27.4	32	24.1	82.2	22.6	SW	223.2	7.3	Ci.-S.		Cu.	SW	8	☉ a.
26.	57.13	26.1	32.5	23.5	90.5	22.6	WSW	141.6	6.5	Ci., Ci.-S.		Cu.	WSW	12	☉ a. ● p.
27.	54.41	27.6	33.8	23.4	83.7	22.6	SW	119.9	3.7	Ci.		Cu.	S	12	☉ a. ● p.
28.	54.57	26.8	31.5	24	85.7	22.4	SW	162.4	5	Ci.		Cu.	SSW, SW	23.6	☉ d° a. ● ☐ p.
29.	57.38	26.1	32.8	23.2	88.8	22.1	SW	107.2	7.7	Ci., Ci.-S.		Cu.	Variable	55.1	☉ a. ● ☐ p.
30.	57.96	26.1	32	22.7	86.3	21.6	SW	143.8	4.8	Ci.		Cu.	SW	2.5	☉ a. ● p.
31.	57.18	27.2	31.2	23.6	82.7	22	SW	135.7	7.5	Ci., Ci.-S.		Cu.	SW	2.5	☉ a. ● p.
Mean	756.45	27.1	31.9	24.1	84.3	22.3		202.7	7.7						
Total								6,284.5						259	

<sup>a</sup> This is an approximate height of the barometer above sea level.

## Meteorological data for first and second class stations—Continued.

## SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied, -1.69 mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Force (mean).	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.		
1.	756.39	25.6	30	24	97.3	23.8	S	1.8	9.5	Ci.-S.		N.	SW	13.2	d a. ● T p.
2.	57.18	26	29.2	23.6	91.5	22.7	S	3.2	8.3	Ci.-S.		N.	SW, S	8	d° < p.
3.	57.58	25.8	30.2	23	91.2	22.5	SW	1.5	7.7	A.-Cu.	WSW	Cu.-N.	WSW	8	Ω a. d° p.
4.	57.15	25.3	29.9	23.1	94	22.5	SW	1.5	8.2	Ci.-S.		Cu.-N.	WSW	14.5	● d p.
5.	56.12	26.5	30.9	22.8	88.2	22.6	SW	1.7	8	Ci.-S.		Cu.-N.	WSW	12.2	T d° p.
6.	56.16	25.8	30.4	23.9	93	22.9	SW	2.8	8.5	Ci.-S.		Cu.-N.	SW	28.2	● d° T p.
7.	56.50	26	29.4	23.2	92	23	SSW	2.8	9.2	Ci.-S.		N.	SW	11	d p.
8.	57.58	24.8	27.7	22.3	96.5	22.4	SW	1.5	9.8	Ci.-S.		N.	SW	2.3	● a. ● a. p. d p.
9.	57.55	27	30.5	23.5	88.8	23.4	SSW	2.3	6.5	A.-Cu.	SW	Cu.	S quad.	4.3	● p.
10.	57.27	27	31.6	24.4	89.2	23.4	SW	1.3	8	Ci.-S.		Cu.-N.	WSW	21.1	● d T < p.
11.	56.87	26.2	30.6	23.3	92	23.1	S quad.	1.8	9.3	Ci.-S.		Cu.-N.	WSW	25.7	● a. p. d° p.
12.	56.94	25.1	29.9	23.2	93.8	22.1	SW	1.5	7.7	Ci.-S.		Cu.-N.	WSW	8	● d p.
13.	56.99	26.1	31.4	22.4	88.8	22.2	SSW	1.2	6.5	Ci.		Cu.	SW	6.1	Γ d p.
14.	56.61	26.2	30	23.9	92.2	23.2	SW	1.3	9	Ci.-S.		Cu.-N.	W quad.	3.3	● a. p. d° p.
15.	53.97	26.9	31.6	23.7	88.8	23.3	WNW	2	9.5	Ci.-S.		Cu.-N.	WNW	5.8	d° p.
16.	53.46	24.6	26.5	23.6	94.5	21.7	SW	3.5	10	Ci.-S.		N.	SW	3.9	d a. p. ● d° p.
17.	58.73	25.8	31.4	22.9	93.2	23	S	1	8	Ci.-S.		Cu.-N.	S	4.1	● a. p. d° p.
18.	59.30	27.5	34.1	23.3	85.7	23	NW	1.2	6	Ci.-S.		Cu.-N.	Variable	73.6	● a. p. d° p.
19.	57.36	26.4	33.9	23	90.3	22.9	NW	2	6.2	Ci.	SE	Cu.	NNE, NE	1.4	● a. p. d° p.
20.	56.58	26.1	29.7	22.9	91	22.7	N, SSE	1.5	8.5	Ci.-S.		Cu.-N.	SSE	18.1	d T < p.
21.	56.82	26.2	30.9	23.6	90	22.6	E quad.	2.2	7.7	Ci.-S.		Cu.-N.	SE	1.1	d° a. Γ d p.
22.	56.58	27	31.4	23.9	87.2	23	S, ESE	2.3	5.7	Ci.		Cu.	S, SW	1.1	Ω a. p.
23.	56.66	25.7	30.5	24.2	92	22.5	SSE	2.5	5.7	Ci.		Cu.	S	1.3	d a. p.
24.	57.40	26.4	31.2	22.7	88.8	22.5	S	2.3	5.7	Ci.		Cu.	S	5	d° a.
25.	58.75	25.4	28.8	23.6	93.3	22.4	SSW	2.7	7.2	Ci.		S.-Cu.	SW, S	8.6	Ω d° a. < p.
26.	57.16	26.1	30	23.3	89	22.2	S	2.8	6.8	Ci.		Cu.-N.	ssw, sw	10.5	d° ● p.
27.	54.15	26.3	30.6	23.6	90.8	23	S	2.8	8.3	Ci.		Cu.	SSE	19	d a. d° < p.
28.	54.48	25.6	29.6	23.1	93.7	22.9	SE	1.8	7.2	Ci., Ci.-S.		Cu.-N.	SSE	70.9	Ω a. d° < p.
29.	57.11	26.5	31.2	23.4	87.3	22.4	S	3.2	6.5	A.-Cu. sw, wsw		Cu.	S	70.9	Ω a. d ● Γ d° p.
30.	58.28	26.6	31.4	23	85.7	22.1	SSW	1.7	5.5	Ci.		Cu.	SSW		
31.	57.88	25.8	32.7	22.5	89.7	21.8	SW	1.8	7	Ci.		Cu.-N.	WSW		
Mean	756.82	26.1	30.6	23.3	91	22.7		2	7.7						
Total															342.3

## DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied, -1.67 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum. <sup>a</sup>			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	755.43	25.7	29.8	23.7	93	22.8	SE	166.6	10	A.-S.	Fr.-N.	SW	28.5	● T a. p.
2.	56.08	25.7	31.7	23	88.2	21.6	E quad.	174.6	8.7	A.-S.	N.	SW	5	p° d T p.
3.	56.70	26.2	30.9	22.5	83	20.8	E quad.	160.5	9.5	A.-S.	Fr.-N.		21.8	
4.	56.22	25.1	30.1	22.5	91	21.4	S, NW	125.2	8.7	A.-S.	N.		77.8	d ● 2 a. p.
5.	55.40	26.2	31	22.9	90	22.6	N quad.	133.6	9	A.-Cu.	Fr.-N.		4.4	d ● a. p.
6.	55.22	26.8	32.5	23.2	87.7	22.7	N, E	132.5	9.7	Ci.-Cu.	N.	W, S	22.8	d ● a. p. ● p.
7.	55.55	26.5	30.8	22.5	87.7	22.4	ESE	189.9	9.8	A.-Cu.	Fr.-N.	SE	36.8	d ● 2 p.
8.	56.64	25.8	29	22.1	90.5	22.3	S	138.4	9.8	A.-S.	Fr.-N.	SW	10.1	● a. p.
9.	56.80	27.7	33.3	23.5	83.8	22.9	SE	214.7	8.8	Ci.-Cu.	Fr.-N.	SW	8.9	● a. p.
10.	56.62	27.5	31.6	24	83.2	22.6	Variable	118.9	9.5	Ci.-S.	N.	W	9.2	● a. ● p.
11.	56.10	26	31.9	23.8	89.7	22.4	NW	185.2	9.8	A.-Cu.	Fr.-N.	SW	15.5	d a. p. ● p.
12.	56.05	25.9	31.5	23	88.2	21.8	SE, NW	181.7	9.7	A.-Cu.	S.-cf.	SSE	10.7	● d p.
13.	56.16	27	32.2	22.1	82.5	21.6	Variable	187	7.7	Ci.-S.	S.-Cu.	SW		
14.	55.84	27.7	31.5	24.6	82.3	22.6	NW	196.5	9.5	A.-S.	Fr.-N.	W	13.5	⊕ ● d p.
15.	53.29	27.7	30.8	24.4	85	23.4	NW, WNW	434.3	10	Ci.-S.	N., Fr.-Cu.	NW	7.4	d° a. ● p.
16.	51.99	24.6	27.9	22	90.3	20.8	SE	378.7	10		N.	SW quad.	72.6	● 2 a. ● p.
17.	57.44	27.7	33.3	23.6	78	21.5	SE	345.6	9.7	A.-S., Ci.-S.	S.-Cu.			
18.	58.66	28.1	32.6	23.5	80.2	22.4	NW	256.7	7.8	Ci.-S.	Cu.			● a. d < p.
19.	56.51	27.9	32.8	23.1	82.7	22.9	N quad.	201.8	8	Ci.-S.	S.-Cu.	SW	2.3	● a. T° ● p.
20.	55.48	25.9	34.4	23	86.3	21.4	SE quad.	217.3	7.8	Ci.	N.	SSW	35.9	d T° Γ d° p.
21.	55.87	27.1	33.8	22.5	84	22.1	SE	213.3	7.7	Ci.	S.-Cu.	SW	3.8	d ● p.
22.	55.61	27.9	33	22.6	82.3	22.7	S quad.	180.2	6.5	A.-Cu.	Variable			d° p.
23.	55.72	26.7	33.1	23.8	87.5	22.7	SE	129.8	8.3	Ci., Ci.-S.	S.-Cu.		25.4	● d p.
24.	56.54	27.4	34.1	23	83.8	22.5	SE	205.2	6.5	Ci., A.-Cu.	N.		4.6	p° p.
25.	57.84	25.7	32.4	23.1	90.2	22	SE	211.7	9.7	A.-Cu., Ci.	N.	SSE	8.9	d a. ● d° p.
26.	56.07	26.7	32.7	23	85.2	22.1	SE	222.1	7.5	Ci., A.-Cu.	N.	SSE	15	● p.
27.	53.18	26.8	33.6	23	87	22.6	SE	237.3	5.7	Ci.	S.-Cu., Fr.-N.	SE	11.7	Γ d° < p.
28.	52.98	27.8	33.9	23.1	81.7	22.4	SE	357	5	Ci.	Fr.-Cu.	SE		T < p.
29.	55.80	28.1	33.1	23.5	77.3	21.6	SE	336.9	4.5	A.-Cu.	S.-Cu.	SSE		d p.
30.	57.32	27.3	33.9	23.3	80	21.4	SE	264.5	6.5	A.-Cu.	Variable		5	Ω d° p.
31.	57.21	27.5	32.6	23	81.3	22	Variable	175.9	7.2	Variable	Variable		19	Γ d° ● p.
Mean	755.88	26.8	32.1	23.1	85.3	22.2		215.3	8.3					
Total								6,673.6					467.6	

<sup>a</sup> The minimum temperatures seem to be too low by about 1°C.

Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.	Upper.	Lower.	
1.	755.38	25.8	29.1	23.5	94.3	23.4	S quad.	3.7	10	Ci.-S.	N.-cf.	24.9
2.	56.15	25.4	29.5	23.2	87	21	SSW	4.5	10	Ci.-S.	N.-cf. SW	11.9
3.	56.78	25.4	28.5	23.4	88.5	21.2	S quad.	3.8	10	Ci.-S.	N.-cf.	42.2
4.	56.34	24.4	28.6	23.1	94.3	21.3	S quad.	2.5	10	Ci.-S.	N., N.-cf.	59.7
5.	55.46	26.1	30.1	22.9	88.5	22.1	S	2.7	10	Ci.-S.	N.-cf.	90.7
6.	55.20	26.2	31.1	23.3	90.2	22.4	S	3	10	A.-Cu., Ci.-S.	Cu.	6.5
7.	55.45	26.2	30.1	23.9	88	22.2	S, SSW	4.5	10	A.-Cu.	N.-cf. SSW	44.4
8.	56.52	24.6	26	23.5	94.7	21.8	S	4.2	10		N.	21
9.	56.85	26.4	30.9	24.1	89	22.7	SSW	3.8	10	Ci.-S.	Cu. SSW	5
10.	56.70	27.1	31.5	24.3	87.3	23.1	SSE, SW	2.7	10	Ci.-S.	Cu. SW, WSW	19.6
11.	56.21	24.7	26.9	23	95	22	SSE	1.5	10		N.	111.7
12.	56.06	24.9	29.4	22.6	92.2	21.5	SE quad.	3.2	10	Ci.-S.	Cu. S	15.3
13.	56.40	26.4	31.2	22.9	87.2	22.2	S	3.2	10	Ci.-S.	Cu. SSW, SW	1
14.	56.16	27.3	32	24	86.2	23.1	W quad.	2.3	10	Ci.-S.	Cu. WSW	.6
15.	53.96	27.9	31.9	24.5	85.3	23.8	NW	3.3	10	Ci.-S.	N.-cf., S.-Cu.	28.3
16.	51.22	24.2	26.9	22.1	93.3	21	SW quad.	7	10		N.-cf. SSW	100.6
17.	57.16	27	31.9	23.9	83.8	22.1	S	4.8	10	Ci.-S.	S.-Cu.	
18.	59.07	28.2	33	24.5	84.5	23.8	NNW	3	10	Ci.-S.	Cu. NNW	
19.	56.80	28.8	32.5	26.5	83.8	24.7	NW quad.	2.8	9.5	Ci.-S.	Cu. NbyE	
20.	55.52	26.9	31.8	24.5	86.5	22.6	SSE	2.8	10	Ci.-S.	Cu. S	12.2
21.	55.91	26.8	31.6	23.1	86	22.5	S quad.	2.8	9.2	Ci.-S.	Cu. S	17.1
22.	55.89	26.7	31.1	23.9	86.5	22.5	S	3	9.2	Ci.-S.	S.-Cu.	2.3
23.	55.91	26.4	30.7	23.9	86.8	22.2	S quad.	3.5	7.8	Ci.-S.	S.-Cu., Cu.-N.	5.9
24.	56.54	26.2	30.8	23.1	86.3	21.8	S, SSE	2.8	8.5	Ci.-S.	Cu., Cu.-N.	33.8
25.	57.66	25.7	28.6	23.6	90.2	22.2	S	3.7	10	Ci.-S.	Cu. S	3.1
26.	56.15	26.3	29.9	23.9	88.5	22.4	S	2.7	9.5	A.-Cu.	N.-cf.	23.1
27.	53.43	27.2	31.3	23.9	85	22.6	SSE	3.3	7.5	Ci.-S.	Cu. N	8.1
28.	52.98	27.2	32.9	24.6	83.7	22.3	SSE	4	9.3	Ci.-S.	N.-cf., Cu.	.4
29.	55.83	27	31.1	24.2	82.8	21.8	SSE	3.7	10	Ci.-S.	N.-cf. S	2.5
30.	57.38	27	31.1	24.2	85	22.4	SSE	3.5	10	Ci.-S.	Cu. S	1
31.	57.42	27.3	31.2	23.7	84.3	22.6	SE quad.	1.8	9.3	Ci.-S.	Cu. SSW	8.4
Mean	755.95	26.4	30.4	23.7	87.9	22.4		3.4	9.7			701.3
Total												

## BAGUIO.\*

[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	634.34	17.9	21	16.3	96.2	14.7	WSW	275.5	9.9	Ci.	N.	9.3
2.	34.78	17.4	22.1	15	88.2	13	SW, WSW	376	9	A.-Cu.	Cu.-N. SW	5.1
3.	35.06	16.3	19.5	14.7	95	13.1	SW	429.1	10	A.-Cu.	Cu.-N.	12
4.	34.33	16.4	18.4	14.5	99.2	13.8	SW quad.	572	10		N.	58.2
5.	33.89	17	19.1	15.4	99.3	14.3	WSW	534	10		N.	44.6
6.	33.64	17.5	21.4	15.4	97.2	14.4	WSW	346.6	8.7	A.-Cu.	Cu.-N. W	69.4
7.	34.12	17.3	20	15.7	95.7	14	SW, WSW	482.7	10		Cu.-N. WSW	28
8.	34.96	16.9	19.8	14.5	95.8	13.8	WSW	758.2	9.7	A.-Cu.	Cu.-N. NW, WNW	29
9.	35.45	17.3	19.6	15.6	93.3	13.6	WSW	739.8	9.9	Ci.	Cu.-N. WSW, W	44.2
10.	35.19	16.8	17.7	15.3	99.2	14.2	WSW	755	10		N.	93.9
11.	34.46	17.1	21.9	15.4	97.7	14.2	WSW	552.4	9.9	A.-Cu.	Cu.-N.	58.4
12.	34.36	16.8	22.1	14.9	95.3	13.6	WSW	436.6	8	Ci.-S.	Cu.-N. W	25.4
13.	34.82	17.6	22.7	14.5	90	13.6	WSW	347.1	8	Ci.	Cu.	18.9
14.	34.52	17.2	19.7	15.6	98.5	14.4	WSW	386.3	9.7	A.-Cu.	Cu.-N. SE	11.8
15.	32.29	17.9	22.4	15	90.5	13.7	NNW	630.1	9.6	A.-Cu.	Cu.-N. NNW	165.6
16.	29.78	15.4	17.4	12.8	91.7	11.9	WSW		10		N.	166.6
17.	36.08	17.9	21.7	16	87.7	13.4	SE quad.	650.9	9.6	Ci.-S.	Cu.-N. SE by E	
18.	37.25	18.7	23.2	16.7	92.3	14.8	SE	267.9	7.7	Ci.	Cu. SW, SE	
19.	35.42	18.4	23.2	15.5	92.2	14.5	WSW	236.5	6.4	Ci.	N. SW	25.6
20.	34.34	18.2	24.2	16	90.8	14	E quad.	283.9	7.1	Ci.	Cu.-N. SE	37.1
21.	34.60	18.5	24.1	16	89.8	14.2	Variable	281.4	7	Ci.	Cu. SE	6.1
22.	34.52	18.5	22.8	15.2	93	14.8	SW quad.	221.9	8	A.-Cu. NW, NNW	Cu. E by S	1.5
23.	34.52	17.3	23.4	15.4	96.2	14.2	WSW	203.3	7	Ci.	Cu.-N. ENE	36.4
24.	35.15	18.1	23.6	15	92.7	14.3	Variable	211.4	5.3	Ci.	Cu.-N. W by N	18.1
25.	35.99	17.4	22.2	15.5	94.3	14	SE quad.	251.8	8.3	Ci.	N.	26.7
26.	34.68	17.6	22.2	15.5	94.8	14.2	SW	274.6	7.9	A.-Cu.	Cu.-N. S	22.6
27.	32.40	18.8	22.5	15.9	95.8	15.5	Variable	325.2	7	Ci.	Cu.-N. E	13.3
28.	32.34	19	23.5	16.3	88.3	14.3	ENE	486.6	5.6	Ci.-S.	Cu.-N. SE quad.	.5
29.	34.62	18	23	15.7	92.5	14.1	SE quad.		6.6	A.-Cu.	Cu.-N. SE quad.	
30.	35.78	18.5	24	15.3	93.2	14.8	E quad.	275.8	7.7	Ci.-S.	Cu. ESE	.5
31.	35.80	17.6	22.1	15.5	93.3	14	NE, W	235.8	9.7	A.-Cu.	Cu.-N. ESE	11.3
Mean	634.50	17.6	21.6	15.4	93.9	14		407.9	8.5			
Total												1,040.1

\* The barometric readings of this station are not reduced to sea level.

## Meteorological data for first and second class stations—Continued.

## VIGAN.

[ $\phi=17^{\circ} 34' N$ ;  $\lambda=120^{\circ} 23' E$ ; barometer above sea, 14.7<sup>a</sup> meters; gravity correction not applied, -1.61 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).		Form and its direction.			
											Upper.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	755.28	27.2	30.8	24.7	82.5	22.1	S quad.	1.2	8.5	Ci.-S.	Cu.-N.	S	d a.
2.	56.07	26.9	31	24.5	82	21.5	SSE	1.7	7.9	A.-Cu. SSE, SSW	S.-Cu. SSE	0.5	○ a. d p.
3.	56.51	26.8	31	24.2	78.2	20.4	SSE	1.2	6.7	Ci.-S.	S.-Cu. SSW		
4.	56.05	26.3	30.5	24.2	84.3	21.4	SSE, SE	1	7.2	A.-Cu.	S.-Cu. SSW	9.4	d° p.
5.													● a.
6.													
7.													
8.													
9.													
10.													
11.													
12.													
13.													
14.													
15.	53.70	26.8	30.1	24.5	88.3	23	NW	1	8	Ci.-S.	Cu.-N. N, NNW	63	d ● p.
16.	48.60	25.5	27.3	22.3	88.2	21.4	S quad.	3.7	10	A.-Cu.	N. SSW	123.4	⊙ a. ● a. p. ● 2 p.
17.	57.23	26.6	32.1	23.2	84	21.7	S quad.	1	10	A.-Cu.	Cu. SE		
18.	59.13	27.4	30.3	24.3	87.8	23.8	WNW	.8	6	Ci.-S.	Cu. SW, WNW		
19.	56.73	26.6	32.7	23.7	84.5	21.7	Variable	.3	5	Ci.	Cu. SW, WNW	7.1	○ a. ● a. p.
20.	55.93	25.8	31.7	23.2	88.2	21.6	ESE, SW	1	6.7	Ci.	Cu. SW	5.4	⊙ a. ● a. p.
21.	56.20	26.6	31.8	23.5	85.5	22	SSW	.3	6.7	A.-Cu.	S.-Cu. SW	2.8	
22.	55.93	27.2	31.7	25.3	86.8	23.2	SW	.7	6.7	A.-Cu.	S.-Cu. SSW	19.6	⊙ a. d a. p. ● p.
23.	55.80	27.4	31.3	25.2	83.3	22.5	SSW	1.2	7	A.-Cu.	N., Fr.-Cu. SSW	11.7	● a. d a. p. ● p.
24.	56.64	27.2	32.5	24.5	85	22.8	SW	.5	5.5	Ci.-S.	Fr.-Cu. SW	9.9	● a. ● p.
25.	57.60	27.3	30.7	25	84	22.5	SSW	.7	7	Ci.-S.	Cu. SE, SSW	8.9	d ● p.
26.	56.34	27.3	31.1	24	82.3	22.2	ESE	.7	5.7	Ci.-S.	Fr.-Cu. SSW		
27.	53.37	27.5	31.3	24.5	85.7	23.3	NW	1	5	Ci.-S.	Cu.-N. NNE, N	.5	d < p.
28.	53.22	27.6	30.9	25.5	86.8	23.7	NW quad.	1	6.5	Ci.-S.	Cu. NNW	14.8	⊙ a. ● a. p.
29.	55.94	27.7	31.3	25.2	85.3	23.3	SW quad.	.7	7.2	Ci.-S.	Cu.-N. SW	.3	⊙ a. d° a. p. ○ p.
30.	57.49	27.5	31.3	24.4	84	22.8	SW	.7	8.8	A.-Cu.	Cu.-N. SW	30.3	d° a. ⊙ a. p.
31.	57.65	27	31.5	24.6	85.5	22.6	SW	.7	8.8	Ci.-S.	Cu.-N. NE	2	⊙ a. d p.
Mean	755.78	27	31.1	24.3	84.9	22.4		1	7.2				
Total												309.6 <sup>b</sup>	

## TUGUEGARAO.

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied, -1.61 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its directions.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	755.64	27.2	34	23.1	86	22.9	W	0.2	9.5	Ci.-S.	Cu.-N.	S	45.2	☉ a. ● 2 a. p. ☐ 3 p.
2.	55.73	27	34.6	23	85	22.3	Variable	.5	8.3	Ci.	Cu.-N.	Variable		☐ a. ☉ ☉ ☐ p.
3.	56.06	26.7	34.4	23.1	84	21.6	SE	.7	5	Ci.	Cu., N.-cf.	SE		☐ 2 a.
4.	55.47	26.8	34.5	23.2	81.8	20.8	S quad.	.7	6.8		Cu.-N.			☐ ☉ ☐ p.
5.	55.15	26.6	35.1	23.3	86.3	22	SE, NE	1.2	7	A.-S., Ci.	cu., cu.-N.	sw, s	80.5	☐ 2 ☉ ☉ ☐ p.
6.	55.27	26.5	34	22.7	87.3	22.4	S quad.	.7	6.7	Ci.-Cu., Ci.-S.	Cu.-N.	S	5.1	☉ a. ● a. p.
7.	55.35	27.1	34.3	23.4	86.3	22.6	Variable	.5	8	Ci.-Cu.	Cu.-N.	S	4.8	☉ a. ☐ p.
8.	55.59	28.1	34	24.2	84.2	23.3	SW, S	.3	7.3	A.-Cu.	Cu.-N.	S, NW	20.8	☐ 2 ☐ 3 p.
9.	55.91	28	32.2	24.5	87.5	24.4	S	.2	8.5	Ci.-S.	S.-Cu.	SW		☉ p.
10.	55.87	27.8	34	24.4	83.3	22.9	SE	.7	8.7	A.-Cu.	Cu.-N.	NW, S		☐ 2 a. ☉ ☐ p.
11.	55.61	27	36.2	23.5	86	22.6	SE	1	8.5	Ci.-Cu.	Cu.	SE	30	☐ ☉ ☉ ☐ 3 p.
12.	56.05	26.5	33.6	24	86.5	22.1	Variable	.5	8.5	Ci.-S.	Cu.-N.	Variable	13.2	d a. p. ● ☐ p.
13.	56.29	27.4	33.5	23.8	84.3	22.5	SE, NE	1.2	7	Ci.	Cu.-N., Cu.	S		☉ ☐ p.
14.	55.90	27.7	33	24.2	81.8	22.4	SW, NE	1	8.2	Ci., Ci.-S.	Cu.-N.	ESE, N		☉ ☐ p.
15.	52.32	25.7	29.5	23.7	88.3	21.6	N, NW	2	9	Ci.-Cu.	Cu.-N.	N	33.6	d ☐ p.
16.	47.50	24.8 <sup>a</sup>	26.4 <sup>a</sup>	21.6	83	19.3 <sup>a</sup>	SE quad.	4.8	9.5		N.		5.3	☉ ☉ ☉ a. ☉ p.
17.	58.75	26.7	35.1	22.8	86.3	22.2	S, SW	.5	6.5	Ci., Ci.-S.	Cu.-N.	E, ESE	8.6	☉ ☐ 3 p.
18.	59.81	27.3	34	23	83.8	22.2	N quad.	.8	4		Cu.	E		☉ a. ☐ p.
19.	57.61	26.2	30.5	23.5	90.5	22.8	Variable	.7	8.2	Ci.	Cu.-N.	N	1.5	☉ a. ☐ p.
20.	56.55	26.8	33.4	24.2	89.3	23.3	SE, S	.3	8.2		Cu.-N.	SE, S	5.3	d° a. ☐ ☐ 3 p.
21.	56.43	27.2	34.6	23	85.8	22.8	SW quad.	1	4.8	Ci.-S.	S.-Cu., Fr.-Cu.	S		☉ 2 a. ☉ ☐ p.
22.	56.08	27.7	34.9	23.7	80.8	22.1	S quad.	1	4.3		Cu.	SSW, S		☉ p.
23.	55.66	27.4	36.2	23.7	82	21.9	Variable	.7	5.3	Ci.	Cu.	SE, NW		☐ 2 a.
24.	56.72	27.6	35.6	23.2	80.7	21.9	Variable	.5	3.5		Cu.	NE		☐ 2 a.
25.	57.80	27.3	35.1	24	84.5	22.5	SW, NW	.8	6		Cu.-N.	S		☐ 2 a.
26.	56.60	27.8	34.3	23.4	82.3	22.6	SSE	.2	3.3	Ci.	S.-cu., cu., N, SE			d ☐ 3 p.
27.	54.20	27.7	35.4	23.8	80.7	22	Variable	.7	5.5	A.-Cu.	Cu.	SW, NE		☐ a.
28.	54.09	28.6	35.5	23.8	79.3	22.8	S, SE	.3	3.2	Ci.	Cu.-N.	S, SW		☐ a.
29.	56.31	27.8	35	24.4	84.2	23.2	SE	.5	5.7	Ci.-S., Ci.	Cu.-N.	E		p° p.
30.	57.34	28.2	35.8	24	82	23.2	SW, NW	1.2	5.5	Ci.	Cu.	SE		☐ a. d p.
31.	57.63	27	32.7	25	85.8	22.6	NE	.5	6.7	A.-Cu.	Cu.-N.	N quad.	3.6	d° a. ☐ 3 ☉ ☐ p.
Mean	755.85	27.2	33.9	23.6	84.5	22.4		.8	6.7					
Total													257.5	

<sup>a</sup> Beginning with August 25th, 11:30 a. m., the height of the barometer above sea was 12.2 meters.<sup>b</sup> 21 days of observation only.

Meteorological data for first and second class stations—Continued.

## APARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total move- ment in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.						
1.	755.14	27.4	33	22.8	84.3	22.6	SE quad.	280.4	10	A.-Cu.	NE	S.-Cu.	S	7.9	☐ ☐ ☐ p.
2.	55.29	27	32	22.8	81.7	21.6	S	279.5	6	A.-Cu.	E	S.-Cu.			☐ ☐ p.
3.	55.56	27.6	33.4	23.6	78.8	21.6	Variable.	248.2	3	Ci.-S.	W	Cu.-N.			☐ ☐ p.
4.	55.10	27.6	32.8	24	78.8	21.5	S, W	236.4	1.3	Ci.-S.	W	Cu.-N., S.-Cu.			☐ ☐ p.
5.	54.85	26.8	32	23.6	82.7	21.5	S quad.	297.9	6.7	A.-Cu.	W	Cu.-N.	W		☐ ☐ p.
6.	54.84	27.1	32.4	23	82.2	21.7	Variable.	298.1	5.7	Ci.-S.	E	S.-Cu.	NW		☐ ☐ a. ☐ p.
7.	54.89	26.9	32.9	23.5	84.3	22.1	S	310	8	Ci.	E	S.-Cu.	W	1.3	☐ ☐ p.
8.	55.30	27.9	32.5	24.1	81.5	22.6	SW quad.	300	7.5	A.-Cu.	W	S.-Cu.	W		☐ ☐ p.
9.	55.41	28	31.5	24.9	77.2	21.5	Variable.	351.6	8.2	Ci.-S., A.-Cu. N, W		S.-Cu.	W		☐ ☐ p.
10.	55.50	28.2	32.6	25.1	76.3	21.6	SW quad.	204.6	9.8	A.-Cu.	W	S.-Cu.	W	2	☐ ☐ p.
11.	55.18	27	33.6	23.8	83	21.7	S quad.	284.2	7.2	A.-Cu.	W	Cu.-N.	NW	1.8	☐ ☐ p.
12.	55.65	27	31.5	24	82.2	21.6	S quad.	256.6	8.7	Ci.-S.	S, E	S.-Cu.	NW	.8	☐ ☐ p.
13.	56.08	27.9	32	23.8	80	22.1	SE	258.9	2	A.-Cu., Ci.-S.		Cu.	WSW		☐ a. ☐ p.
14.	55.80	28	30.9	24.8	81	22.7	NE, NNW	390.1	8.3	Ci.-S.	E	Cu.-N.	NW		☐ a. ☐ p.
15.	52.23	27.4	29.5	24.5	86	23.3	NW	762.3	9.3	Ci.-S.		Cu.-N.	NW	42.7	☐ a. ☐ p.
16.	44.43	24.9	28.5	22.6	87.2	20.4	SSE	1,517.1	10	Ci.-S.		N.		17.8	☐ a. ☐ p.
17.	58.46	27.4	32.4	22.7	78.8	21.1	S quad.	229.2	6.7	A.-Cu., Ci.SSE, W		S.-Cu.			☐ a. ☐ p.
18.	59.99	27.7	31.5	23.6	82	22.5	NE	235.7	8	A.-Cu.		S.-Cu.		8.1	☐ a. ☐ p.
19.	57.61	27	30.6	24.6	87	23.2	E quad.	225.7	8	A.-Cu., Ci.-S.	E	Cu.-N.	E	7.9	☐ a. ☐ p.
20.	56.39	26.9	31	24.4	87.2	22.9	Variable.	218.7	3.5	A.-Cu.	S	Fr.-Cu.	SE		☐ a. ☐ p.
21.	56.19	27.2	32.8	23.3	81.3	21.8	SE, ENE	259.5	8			Cu.-N.	N		☐ a. ☐ p.
22.	55.79	27.9	32	24.1	81	22.5	Variable.	210.1	3.8	Ci., Ci.-S.	E	Cu.-N.			☐ a. ☐ p.
23.	55.40	27.8	32.6	24.4	80.5	22.2	S	205.4	8	Ci.		Cu.	W		☐ p.
24.	56.30	27.9	32	23.6	78	21.7	Variable.	259.4	1.2			Cu.-N.	NE		☐ p.
25.	57.59	28.1	32.6	24.1	79.3	22.2	S, N	276.8	1.5			Cu.	W		☐ p.
26.	56.35	27.8	32.5	24.1	80.3	22.2	S	252.3	1.7			Cu.-N.	NE		☐ a. ☐ p.
27.	54.06	28	32.1	24.1	80.2	22.4	NE	288.2	1.8			Cu.-N.	E		☐ a.
28.	53.80	28.5	33.1	24.6	78	22.3	SE quad.	270.7	5			Cu.	S		☐ a.
29.	56.11	29	33.1	25.6	79.2	23.5	W, ENE	211.6	2.3	A.-Cu.	SE	Cu.-N.			☐ p.
30.	57.42	28.6	33.1	25.1	81.7	23.6	NE quad.	267.5	2.7	Ci.-S.		Cu.-N.	SW, N		☐ p.
31.	57.47	27.6	31	25.4	84	23	W	258.4	7.8	Ci.-S.	E	N.	N	6.9	☐ a. ☐ p.
Mean	755.49	27.6	32	24	81.5	22.2		320.8	5						
Total								9,945.1						97.7	

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, AUGUST, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan		2.5								5.6	.3					.8
Zamboanga		2.5								29.7						
Davao										8					1	
Cotabato	2.3	1	1.3					3.3	21.6	2.8	14.7				90.2	
Cagayan, Misamis	11.9					16.5	4.6	1.5	44.7	.5	4.3	.8		4.1	.5	20.6
Butuan	.3					.8						1	.8		.3	22.1
Dumaguete						1							2			14
Yap, W. Carolines	27.7	4	11.2	.5	3.6		8.1	.5	6.9	.5	80.3	90	5.9		1.6	.5
Maasin					7.1		24.1		38.6			47.8	35.1		35	13.5
San José Buenavista	11.6	10.7			99.8	42.7	16	32.3	7.9	5.9	1	19.1	1.8	5.3	59.7	4.1
Cuyo	1.8				40.7	16.3	48.2	16.8	1	27.9	3.8	1.5	13.5	19	16.8	3.8
Guiuan	4.3			7.6	2.5							12.4				
Borongan	8.4			3	2.1							53.8	3.1			
Masbate	4.6			6.1	9.4	1.5	2					1	9.9	2.5	.8	9.7
Romblon	1.6			29	7.1	3.6	27.7	8.6			1.3		3	4.8	4.1	15
Batag				2								2.5	22.6	1		
Gubat	2.5	1	1.3	3.8	42.2							34	2	1.5		
Sumay, Guam	6.3	1.9	25.4	4.4	8.9	21.6	11.4			26.7	3.8	24.7	10.8		6.4	3.2
Calapan	6.4	.4	11.2	21.9	66.6	5.1	7.6					4.1			1.3	28.9
Virac	10.7				.3		.3						51.1	7.4	4.6	
Nueva Caceres	40.4	2.9		2.5		37.7	1.3					3	10.8	1.3	4	32.5
Batangas	21.1	29.5	15.7	15.2	81	4	1		.5			.5	3	6.9	11.2	31.8
Silang	8.1	6.6	20.3	49.3	5.4	2.5	5.3				18	.8			15	5.1
Santa Cruz, Laguna	8.4	.8	8.9	75.5	5.9	11.9	3			1.3	6.4	28.1	4.6	3.8	4.4	41.6
Antipolo	30.5	1.8	4.3	12.5	1	33.5	7.1	1.8	8.4	57.9	33.8		18.8	11.2	24.9	48.2
Iba	63.7	6.9	2.1	142.8	22.9	83.7	97.6	63.4	12.3	51	120.1	6.5	6.1	21.3	17.5	35.3
Tarlac	10.1		2.5	20.4	18.3	17.7	32	27.9		11.2	8.4	32.5		6.9	5.1	7.3
Baler	5		.5	1.3		.4	10.4	4.6					1.5		1.5	3
San Fernando, Union	3.3	.5	5.3	24.2	5.1	6.9	35.8	2	11.9	54.3	12.2	5.3	.8	39.6	73.6	120.9
Echagüe	4.3		1.3		30.2	4.1	43.4	3	35.6		13.2	25.1	23.9		11.2	12.2
Candon		1.3		2.5	10.7	36.8	45		4.6	12.4	37.8			9.9	143	179.9
Laoag	.3			1	.8	12.2	4.3	.3	12.9	36.8	51.6	2.3			29	146.5
Santo Domingo, Batanes	.5		.1	1.4		1	1	11.7	11.9	26.1	2.6	5.5		1.2	48.2	13.9

Station.	Day of month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Isabela, Basilan	22.4	4.6	.3		3	6	.3	16.5	53.1		8.1	1.3		10.7	1.1	137.2	
Zamboanga	24.9	1.8	6.1			1	5.9	9.7			19	48.3	11.2	7.1	8.9	176.1	
Davao	.3	2.3		7.9	14.7						2	41.1	6.6		4.6	83.8	
Cotabato	46.2	2.5		3.6	2									1.8	2.5	191.2	
Cagayan, Misamis	27.7	14.5	.5	27.9	7.1			15.2		5.8	44.5	20.6	12.4	64.8	25.2	302.4	
Butuan	29.5	50.3	24.4	.5		24.4	15.3	31.5			6.4	17.3	7.6	4.6	2	317.9	
Dumaguete	16.5	4.6	1.5	55.6	43.7	1.3						12.2	5.6		35.6	193.7	
Yap, W. Carolines	9.4	69.6	1.4		5.6	4.3			2	.5	20.2	12.5	6.3	3	2.8	140.7	
Maasin	1.5	14.5	.8		7.9	.8	.5	24.1	9.7	9.4	17	39.1	12.5	.8	15.5	442.1	
San José Buenavista	27.4			29.7	13.5	7.1	12.2	21.8								264.4	
Cuyo	1.8	10.7	37.8	19.3	20.6	68.6	57.2	34.3	4.3	41.4	25.9	42.2	20.6	33.2	18.3	754.1	
Guiuan	2.3	1.5	1		57.1	29	4.6	77.3	2.3	61.7	5.9		1	7.6	14.8	477.2	
Borongan	20			4.8		2							(a)	(a)	(a)	53.6	
Masbate	2.1		13.2	54.4	11.2	2.3	.3	.5	1.3		1	1			1.8	159.5	
Romblon	1	.3	8.9	.8		6.4			1	1.3					4.8	72	
Batag	2.3			5.1	.3	12.7	1.8	1	2.5	4.3	4.1	5.4	5.9		1.5	149	
Gubat	7.6	1.3	71.1	1.5		2	3.6	1.3					4.1		6.3	126.9	
Sumay, Guam	1		53.3	5.1			8.9		15.2			1	1.3		14.2	188.3	
Calapan	82.5	1.9	9.5	37.5	10.8	5.1	3.1		2.5			10.8	59.6	10.1	388.9		
Virac	6.9	.5					1.3	.5	9.5		1.8	21.5	1.8			197.9	
Nueva Caceres		4.2	103.9	.3		9.9					1.1			2		195.8	
Batangas	18	4.1	14.2			2.5				.5	4.3	4	10.3	2.5	21.3	244.2	
Silang	1.6	8.1		4.1		(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	3.6	
Santa Cruz, Laguna	2.8					22.3		9.1	13.5							187.7	
Antipolo	16.3	1.8	4.3	1.8	40.1	1.3			17.4	8.1	5.9	17.6	1.3	1.8	7.6	329.9	
Iba	1.5	29.7	61.7	7.3		.5	1	60.7	27.9	30.2	19.5	10.7	4.4		22.9	573.7	
Tarlac		3.6	7	8.8	15.3	1.3	11.5	32.7	86.7	22.4	68.1	2	2.5	10.7	6.4	1,025.9	
Baler			45.2	22.9	9.7			7.6	8.1	38.9	12.9	.8	3	4.8	3.8	358	
San Fernando, Union	1.9	.5		2.3	2.8			11.2	.8	4.8	10.4	4.1	4.9	13.2	45.7	130.8	
Echagüe		31	1	17	1	5.3	3.3	3.6	85.1	16.8	3.6	4.1		9.4		582.9	
Candon	4.1		1.8	3.5	18.3			1	34.8	.5		.3			7.9	280.7	
Laoag		7.1		33.8	1.8	2	1	12.7	14.7	3.8	1	3.8	2			567.6	
Santo Domingo, Batanes	1.3	1.3		7.4				5.6	2				4.8	8.6	6.1	332.5	
								.8								128.5	

a No observation.



## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, AUGUST, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Butuan.		Dumaguete.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	32.6	24.4	31.1	23.1	30.2	24.7	30.9	24	26.9	22.2	32.5	23	31	24.6	32.5	23.7
2	31	23.3	30.9	22.6	27	-----	33.7	21.8	31.6	21.7	33.5	23 ?	31.6	24.5	34	23.8
3	32.9	23.2	32.6	22.6	30.5	25.9	32.7	22.3	30.7	22	32.6	22.5	31.7	23.1	33.8	21.8
4	34.1	22.3	32.6	22.1	29.8	25.4	32.7	22	31.4	22.4	32.6	22.6	32.1	23.8	35	23
5	34.2	24.2	33.1	21.8	30.9	26.1	32.2	22.4	33.4	22.8	34	22.9	32.5	24.1	32.5	22.8
6	34	24.8	32.1	22.5	30.1	24	31.8	22	32.2	22.3	32.1	23.5	31.5	24.6	31.6	22.8
7	33.9	24.6	32.6	22.1	30.5	23.7	32.7	22	32.7	21.7	32.8	21.8	32.5	24.1	32.5	23.5
8	33.8	23.3	32.6	22	30.9	23.5	31.7	23	32.5	22.3	32.4	22.2	31.6	24.1	33	23.4
9	30.8	23.1	30.8	22	29.5	24	32.2	22.3	30.8	21.6	31.1	21.9	31.1	24	32.1	24.2
10	32.8	23.1	31.8	23.1	29.2	23.5	31.4	21.4	32.8	22.2	32.2	22.3	32	23.4	32.8	22.8
11	30	21.8	31.3	22.1	30	25.9	32.2	21.6	31.3	21.9	32.6	23	31.8	23.3	32.3	23.7
12	32.6	23.3	30.9	21.6	30.1	23.5	28.2	21.6	30.6	22.7	31.8	21.5	30.7	22.8	32.1	22
13	31.8	22.3	31.8	21.4	30	23	31.2	21.8	30	22.8	32.2	23	30.5	24.3	31.2	24.2
14	31.9	22.3	30.6	21.6	29.6	22.5	31.7	21.2	31.3	21.7	31.6	21.8	32.1	23	31.2	22.3
15	32.4	23.4	31.1	21.6	29.8	23.5	31.5	22.3	31.8	22.1	31.6	22.3	31.5	24.2	32.8	24.1
16	33.7	23.9	32.8	22.1	29.6	24	31.3	22.2	33.7	22.5	33.1	23.5	33.6	24.7	33.8	23.6
17	31.5	23.4	33.2	23.1	29.9	23.9	31.6	22.3	33.4	22	30.5	22.6	30.1?	23.7	30.8	22.5
18	27.9	22.7	29.6	23.1	28.1	23.5	31.7	22.7	31.3	22.8	30.6	21.5	31.1	23.6	30.3	23.6
19	30.9	21.5	31.4	22.9	31.1	23.4	31.7	22.6	32.1	22.2	31.1	22.5	30.3	22.7	29.8	21.2
20	30.7	21.8	31.1	22.2	31.6	25.4	31.8	22.7	30.7	23.2	31	22.7	32	23.2	30	23.5
21	30.8	21.9	31.2	22.1	29.5	23.2	31.7	22.5	29.8	22.2	30.7	22.7	29.6	23.1	32.5	23
22	30.2	21.8	30.1	22	29.4	23.2	31.5	22.9	29.7	22.4	31.8	23.4	30.6	23.2	30.7	23.4
23	30	23.4	28.6	23.1	27.5	25	31.7	22	30.2	22.3	31.7	22.5	30.3	23.8	31.3	23.3
24	31.6	22.7	31.6	22.3	30.5	24.1?	30.3	21.6	31.5	22.2	31.5	22	30	23	31.7	23.1
25	29.2	22.1	30.8	22	-----	22.5	32.5	21.9	31.8	22	30.7	22.1	29.8	23.6	32.5	22.8
26	31.8	21.4	31.2	22.1	-----	-----	31	22.3	30.3	22.3	32	23.6	29.6	24.9	32.2	22.9
27	32.5	23.8	30 ?	22.3	-----	-----	30.8	22	30.6	22.2	31.5	23.5	30.7	24	28.5	24
28	31.8	21.4	30.3	22	-----	-----	28.6	22.1	29.6	21.3	32.1	21.2	30.3	24.4	29.6	22.7
29	32.7	23.7	31.6	21.5	-----	-----	29.2	22.1	31.2	22.1	30.7	22.5	27.5	23.1	30.5	22.6
30	30.9	22.7	31.8	21.4	-----	-----	31.7	22.1	30.8	21.7	30.4	21.9	28.2	22.9	30.5	21.7
31	30.7	20.8	29.2	21.6	-----	-----	29.7	22.1	29.4	22.7	28.8	22.5	28.1	25.6	30.3	22.6
Mean	31.8	22.9	31.3	22.2	29.8	24	31.4	22.2	31.2	22.2	31.7	22.5	30.8	23.8	31.8	23.1

Day.	Yap, W. Carolines.		Maasin.		San Jose Buenavista.		Cuyo.		Guiuan.		Borongan.		Masbate.		Romblon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30.1	22	30.8	22.9	-----	23.1	32.6	26.4	31.7	27.2	31.3	23.4	32.2	25.8	33.2	24.2
2	28.4	23.2	32.4	25	-----	22.9	31.2	24.5	29.8	25.3	32.4	24.3	31	26.2	34.1	25
3	31.3	23.5	32.5	24.4	-----	24.1	32.2	24.4	31	27.3	33.5	23.5	31.6	26.8	34.6	25.8
4	31.6	23.4	32.5	24.4	-----	24.5	31.4	25.1	31.3	27.4	34.1	21.3	31.2	26	34.3	24.2
5	30	25	30.6	24.4	-----	24.8	29.7	26.2	30.5	25	33	22.5	33	25	27.6	23
6	31.7	23.6	30.5	23.4	-----	22.8	26.9	23.6	30.8	25	32.8	23	29.8	24.5	30	24.1
7	32	24.4	30.6	23.6	-----	22.6	29	24.3	30	27.4	33.8	20.8	31.4	25.5	30.5	23.8
8	32.2	25.2	30.9	23.6	-----	23.5	31.3	23.6	30.2	27.3	33.5	21.4	31.8	26	31.8	23.2
9	30.5	24.4	31	23.5	-----	23.5	29.3	23.9	31.7	26.7	33.9	23.5	32.6	26.2	34.2	23.3
10	32.2	23.2	31	23.6	-----	22.6	31.9	24.9	31.6	27.4	33.4	22	31.4	26.6	35.1	25.5
11	29.6	23.2?	31	23.4	-----	22.4	32.8	22.9	30.4	26.6	34.3	22	30.6	26.6	33	25.4
12	-----	-----	30.3	23.6	-----	23.5	32	24.1	31.4	24.4	33.5	21.3	31	26.4	32.1	23.1
13	28.1	-----	30.2	22.7	-----	23	30.5	24.5	31.6	24	27.4	-----	29.4	25.4	31.6	23.4
14	31.7	24.9	31.4	22.6	-----	23	28.8	22.8	28.7	26.5	30.9	-----	28	25.4	29.1	23.4
15	31.7	23.5	31.4	22.5	-----	23	30.1	23.9	29.2	27.4	32.5	-----	30	26.2	35.2	23.8
16	32.7	23.1	31.5	25	-----	22.6	31.1	23	30.2	27.5	31.8	-----	30.5	26.5	30.9	22.8?
17	32.2	24.2	31.8	24.4	-----	23.4	30.4	24.1	31.9	24.8	32.1	-----	31	32	32.1	23.1
18	31.9	24.9	31.6	24.4	-----	24	30.5	24.4	31.2	23.8	31	-----	31.8	25.6	32.6	23.4
19	30.7	22.6	30.2	23.4	-----	23.2	30.7	25.9	31.1	23.8	32.6	-----	30.6	25.5	-----	-----
20	30.8	24.6	31	23.3	-----	23.5	31	24.1	30.2	26.8	33.2	23.5	31	26	-----	-----
21	30.7	24.4	31	23.4	-----	22.6	30.7	24.2	30.4	24.3	32.8	-----	30.6	25.6	33.7	24.1
22	28.9	22.5?	31.2	22.4	-----	23.1	30.5	22.9	30.3	26.5	33.6	22.9	31.4	26	33.1	24.7
23	31.4	23.7	29.9	22.4	-----	22.9	27.8	23.4	30.4	25.4	32.6	-----	31.2	25.6	31.8	23.8
24	31.2	24.1	31.2	22.4?	-----	23.3	30.6	24.9	30.9	25	32.1	23.2	31	25.6	33.3	22.4?
25	30.7	22.6	31.2	22.4?	-----	22.5	30.6	24.4	30.3	26.9	33.1	23.7	30.8	25.8	33.3	23.8
26	30.5	22.5	31.5	22.5?	-----	22.5	32.6	25	30.6	26.5	32.1	25.5	30.6	26.2	33.5	23.2
27	31.6	24.5	31.5	25.4	-----	22.4	28.3	22.7	30.5	27.4	33.6	-----	30	25.6	32.7	23.8
28	31.9	24.5	31.5	24.7	-----	23	29.6	23.9	31	26.2	32.1	-----	29.6	26	33.2	22.5
29	30.4	22.1	29.2	24.6	-----	23.5	31.6	25.4	-----	-----	30.8	22.4	31.2	26.4	32.1	22.8
30	30.8	24	29	24	-----	22.3	30.5	23.4	-----	-----	33.1	23.1	31	25.8	33.6	23.7
31	30.3	23.5	29.4	23.6	-----	22.3	30.3	22.9	-----	-----	30.1	24.9	30.5	26.2	32.5	23.4
Mean	30.9	23.7	31	23.6	-----	23.1	30.5	24.2	30.7	26.1	32.5	22.8	30.9	25.9	32.6	23.7

Maximum and minimum temperatures for third-class and rain stations, August, 1913—Continued.

Day.	Batag.		Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	31.5	24	32.6	25.5	30.8	25.4	28.6	23.7	32	-----	32.4	23.4	28.6	24.7	27.5	18.2
2	31.5	23.4	31.7	24.9	29.9	25.4	29.7	22.8	31.2	-----	30.5	23	27.5	24.2	28	18.8
3	31.4	23.8	32.8	25.4	27.7	24.4	33	22.9	32.5	-----	32.6	22.6	30.9	23.8	28.5	18.1
4	31.6	23.4	32.6	25.1	29.6	24	32.6	22.4	31.5	-----	31	22	29.8	22.8	28.8	18.5
5	317	23.3	32.1	24.5	29.4	25.3	25.1	22	30.6	-----	31.5	22.9	26.3	22.9	26.37	17.4
6	30.5	22.4	28.8	24.1	30.3	23.4	29.7	22	29.5	-----	30	23	29.8	23.1	28.1	18
7	31.6	23.2	32.4	24.8	28.8	23.7	30	23	30.5	-----	31	23	29.7	23.2	29.5	18.5
8	32.4	22.3	33.4	25	30.2	23.5	31.5	23.4	33.2	-----	32.2	24.3	31.8	23.5	30	18.1
9	32.5	23.6	33.3	25.4	30	24.2	32	22.3	33.4	-----	31.8	24	32	23.4	29.7	18.8
10	30.9	23.5	33.2	24.2	30.8	25.7	32.5	24	31.6	-----	32.7	23.5	31.9	24.2	30.5	18.9
11	30.5	23.6	32.7	25	30	23.4	34.5	22	31.5	-----	32.5	23.6	31.6	25	30.1	18
12	31	23	34	24.4	28.9	25	30.5	22	33	-----	32.7	22.4	31.4	23	29.8	18.1
13	26.5	23	32	24.7	29.6	23.9	31	22.1	31	-----	32.4	23	31.2	23	29.2	19.5
14	27.5	22.4	28.7	23.4	29.9	24.5	27.17	24	27	-----	27.4	23.7	28.8	23.2	30.5	19
15	29	23.5	28.8	25.2	29.8	25.1	29.4	25	30.2	-----	29.7	23	29.9	24.5	30.7	19.1
16	31.5	22.9	31.2	25.3	30.8	25.3	25.5	22.8	30.2	-----	29.5	22.7	29.4	23.8	30.2	19
17	31.6	22.6	31.3	23.4	30.4	25.3	30.4	21.7	32.6	-----	31.7	21.7	30.1	22.6	27.3	19.5
18	31.9	22.6	32.5	24.3	28.4	23	31.6	23.2	30.8	-----	32.3	21.7	32	22.9	30.4	19.9
19	30	23	33	24.5	28.8	23.2	32	22	31	-----	32	23.1	31.8	22.2	31.8	19.6
20	30.5	21.5	31.1	23.9	27.9	23	31.3	22.6	31.4	-----	31.1	23.9	30.4	24.6	31.9	19.3
21	30	22.5	32	23.9	27.8	23.4	31.2	22.5	31.8	-----	32	22.7	31.8	23.4	30.8	20.1
22	31	22.5	33	24	29	23.2	31	21.5	32.3	-----	32.17	22.6	31.5	23.2	30.2	19.8
23	30	22.9	34.2	24.8	28.9	24.9	28	21.9	30.1	-----	31.8	22.7	-----	-----	31.8	20
24	31	23.6	32.8	25.1	30.2	23.7	31.8	22.2	31.5	-----	32.6	23	-----	-----	32.2	19.1
25	31	23.4	31	24	30.4	24.4	29.9	23.5	31.7	-----	32	21.87	-----	-----	28	19
26	30.4	23.5	32.2	24.9	30.1	24.3	31.7	22.8	32	-----	32.1	23	-----	-----	27.7	18.7
27	31.7	22.8	31.3	24.4	30	-----	30.4	22.5	29.9	-----	31.5	23.2	-----	-----	28.1	19
28	31	22.9	32.7	24.6	31	25.4	28.5	23.1	29.8	-----	30.3	23	-----	-----	30	19.5
29	30.9	23.5	32.7	24	29.8	26.2	-----	23.5	31.9	-----	29.6	23.1	-----	-----	30.5	19
30	29.9	23	32.6	23.9	29.3	24.1	31.5	22.5	31.9	-----	32.7	22.4	-----	-----	31.2	19.8
31	27	24.1	32.7	24.9	29.8	23.5	29.4	22	30.1	-----	32.9	22	-----	-----	31	19.3
Mean	30.6	23.1	32.1	24.6	29.6	24.3	30.4	22.7	31.1	-----	31.5	22.8	30.2	23.5	29.7	19

Day.	Sta. Cruz, Laguna.		Antipolo.		Iba.		Tarlac.		Baler.		San Fernando, Union.		Echague.		Candon.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30	23	28.7	23.2	27.7	24	29	24	33	24.5	30.5	24	33.8	23.4	30.5	25.4
2	29.4	23	26.2	21.4	28	22.5	30.2	23.5	32	23.7	32.1	23.7	34	22.3	29.9	24.8
3	29.9	23.5	28.3	22.1	28	23	29.6	22.5	32.4	24.7	32.9	24	34.4	22.2	30.6	24.7
4	28.1	22.5	26.2	22.2	26.5	23	28.9	22.5	33.1	24.4	31.7	23	32.6	22.5	29.5	25
5	30.2	22.1	28.6	21.4	26	22	29.9	22.5	33.4	24.5	32.1	23.2	33.3	21.8	27.3	25
6	30.7	23.6	29.5	22.8	30.5	22.5	31.7	23.4	33.5	24.4	34	23.8	32.4	22.9	29.9	24.5
7	29.9	23	28	21.6	29.4	22.8	30.6	23	32.5	24.3	33.5	24	32.9	23.6	30	24.5
8	31.6	22.9	29.1	21.4	27.9	22.6	28	22.7	30.9	23	30.1	22.2	33.3	23.5	29.4	24.5
9	32.7	22.7	30	22.4	30.7	24	32.2	24	32.8	24.2	31.4	24.4	33.3	23.4	30.2	26
10	32.7	24.5	30.1	23.2	31	24.5	32.1	24.4	32.8	25.1	30.9	23.6	33.3	23.5	29.9	26.1
11	32.2	24	29.1	22.4	26.6	23.5	33.1	23.8	33.4	24.7	32.1	22.7	34.4	23.4	27.9	24.7
12	30.4	23.1	30	21.9	29.5	22.5	31	23.4	34.5	24.2	32	22.7	31.5	22.8	29.8	24
13	31.1	22.5	29.1	22	31	21.7	31.5	22.8	34.1	23.2	31.7	22.5	31.5	23.3	30	24
14	29.1	23.6	27.8	22.6	29.5	23	30.6	24.1	31.5	24.2	30.9	23.8	33.3	22.1	30.3	25.6
15	30.6	24	29.6	22.7	30.6	23.5	33.1	21.9	32.2	25	31.1	23.7	29.8	23.8	29.9	25.5
16	26	23.5	26	21.8	26.5	24	24.7	23.3	32	25.2	27	21.9	25.5	19.9	23.6	22.67
17	31.4	23.3	31	22	30.5	23	32.5	23.3	32.1	22.6	31.9	23.7	31	22.3	29.9	23
18	32.4	23.8	31.2	21.8	31.5	23	35	23.1	32.6	22.8	32.4	24.5	33.4	22.4	30.8	25.7
19	33.1	22.5	31	21.3	31	23	34.9	24.4	34	22.7	32.5	23.9	31.1	23.4	29.9	25.1
20	28	23	27.7	22.5	30.6	23.5	31.4	23.5	32	23.5	31.9	23.6	32.3	24.2	29.5	25.5
21	31.6	23	30.1	22.8	31.1	23	31.7	23.5	32.3	22.1	31.9	22.7	33	23.9	29.7	23.4
22	31.9	22.5	30.1	23	28.9	22.5	31.5	22.5	34.2	22.4	32.4	24.4	33.9	22.2	30.2	23.4
23	33.1	22.5	30.6	22.6	30	22.7	31.6	23.1	35.3	23.9	32.1	24.2	33.9	23.4	30.6	23.27
24	33.1	22.9	29.4	22.7	30	22	32.6	23	34.6	23.3	31.9	23.7	33.9	22.4	30.7	23.2
25	28.6	23	27.7	21.9	28	23	29.9	22.4	33.8	22.7	32.7	23.5	33.9	22.3	30.7	23.2
26	30.9	23	28.1	22	28.5	22.5	30.1	23.2	34.7	23.9	32	23	32.9	22.3	29.9	24.5
27	31	23.5	30.2	22.4	31.3	22	30.8	23	32.5	23.4	31.1	23.9	33.3	23.9	30.6	25.6
28	30.9	23.5	30	22	30.5	23.5	30.6	23.5	31.8	24.3	32.1	23.9	33.5	23.4	31.2	26.2
29	31.3	23.5	29.4	22.1	31.1	23	30.4	22.5	32.9	23.9	32.2	24.5	33.8	23.9	30.4	26.8
30	31.2	22	29.8	21.9	30.9	23	31.7	22.7	34.5	23.4	32.6	24	33.8	22.5	30.9	26
31	31.7	22.5	30.8	23	30.4	22.5	34	22.9	32.9	23	31.6	23.7	33.1	23.4	29.9	26
Mean	30.8	23.1	29.1	22.2	29.5	22.9	31.1	23.2	33	23.8	31.8	23.5	32.8	22.9	29.8	24.8

Maximum and minimum temperatures for third-class and rain stations, August, 1913—Continued.

Day.	Laoag.		Santo Domingo, Batanes.		Day.	Laoag.		Santo Domingo, Batanes.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.		°C.	°C.	°C.	°C.
1	32.2	23.9	32	24?	17	32.5	23.1	31.1	25.2
2	31.9	24	31.4	24.3	18	32.2	23.3	33	25.4
3	31.6	23.8	30	25.3	19	34.2	23.5	31.5	24.8
4	31	23	31	25.1	20	32.4	24.1	32.2	24.1
5	30.9	24.5	31.2	24.3	21	32.6	23	32.4	24.3
6	31.6	23.6	31.4	23.4	22	32.1	24.1	31	23.9
7	31.4	23.9	30.5	24.5	23	32.3	24	31.7	24.4
8	31.4	23.7	29.9	24.5	24	31.8	24.1	31.6	24.8
9	29.9	24.5	28.4	23.9?	25	31.8	23.5	31.5	24
10	29.8	24.2	29.5	24.5	26	32.1	23	31.5	24.3
11	32.2	22.9	28.9	23.6	27	32.7	23.9	31.2	23
12	31.7	22.7	30.4	24.3	28	32.3	24.2	32.9	23.3
13	32.3	23.1	30.5	23.7	29	32	25.4	33.3	25.2
14	31.5	23.9	31.2	23.9	30	32.1	24.8	33.1	26
15		24	30.5	24.8	31	30.6	24.5	33.5	
16			28	23.7					
					Mean	31.8	23.8	31.2	24.4



## SEISMOLOGICAL BULLETIN FOR AUGUST, 1913.

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*Asistant Director of the Weather Bureau.*

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### EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

8, 3<sup>h</sup> 48<sup>m</sup> [8, 11<sup>h</sup> 48<sup>m</sup>]. Gubat (SE Luzon). Oscillatory earthquake, direction N-S, intensity III.

16, 16<sup>h</sup> 40<sup>m</sup> 11<sup>s</sup>\* [17, 0<sup>h</sup> 40<sup>m</sup> 11<sup>s</sup>]. Dagupan (W Luzon). Earthquake of intensity III. The origin of this earthquake was, according to the records of the seismographs of the Observatory, in the China Sea to the W of the Zambales coast. Probably owing to the lateness of the hour at which the earthquake took place, it was not noted in other towns, though in many of them it must have been as intense as in Dagupan.

22, 16<sup>h</sup> 03<sup>m</sup> [23, 0<sup>h</sup> 03<sup>m</sup>]. Butuan (N Mindanao). Oscillatory earthquake, direction NE-SW, intensity III.

26, 20<sup>h</sup> 03<sup>m</sup> [27, 4<sup>h</sup> 03<sup>m</sup>]. Butuan (N Mindanao). Oscillatory earthquake direction SW-NE, intensity IV-V, duration about 15 seconds.

26, 20<sup>h</sup> 20<sup>m</sup> [27, 4<sup>h</sup> 20<sup>m</sup>]. Dumaguete (SE Negros). Oscillatory earthquake direction ESE-WNW, intensity IV, duration 10 seconds.

28, 21<sup>h</sup> 19<sup>m</sup> 9<sup>s</sup>\* [29, 5<sup>h</sup> 19<sup>m</sup> 9<sup>s</sup>]. Batag (NE Samar). Oscillatory earthquake direction N-S, intensity III, duration 3 seconds.

30, 4<sup>h</sup> 04<sup>m</sup> 48<sup>s</sup>\* [30, 12<sup>h</sup> 04<sup>m</sup> 48<sup>s</sup>]. SE Luzon, NW Samar, and Masbate.—Earthquake of intensity III-IV; the epicenter was probably to the NE of the Island of Masbate.

30, 16<sup>h</sup> 30<sup>m</sup> [31, 0<sup>h</sup> 30<sup>m</sup>]. Butuan (N Mindanao). Oscillatory earthquake direction SE-NW, intensity III, very short duration.

30, 20<sup>h</sup> 16<sup>m</sup> [31, 4<sup>h</sup> 16<sup>m</sup>]. Davao (SE Mindanao). Oscillatory earthquake direction SSW-NNE, intensity IV, duration 4 seconds.<sup>2</sup>

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<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observer who sent the report. All time indications are in Greenwich mean time (Midnight=0<sup>h</sup>), Insular time being added in brackets for the convenience of Philippine readers.

<sup>2</sup> The Benguet earthquakes are stated separately.

## RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0<sup>h</sup>. Instrument: Wiechert seismograph; 1,000 kilograms.  $A_N$ :  $T_0=6.2$ ,  $\epsilon=2.21$ ,  $\frac{r}{T_0^2}=0.055$ ;  
 $A_E$ :  $T_0=6.4$ ,  $\epsilon=2.64$ ,  $\frac{r}{T_0^2}=0.034$ . Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
252	1	Ir	e F	<i>h. m. s.</i> 17 19 15 18 12				
253	2	Id	iP M <sub>E</sub> M <sub>N</sub> F	5 43 07 43 14 43 25 50	2 5		75 39	
254	4	Ir	eP eS iL M <sub>N</sub> M <sub>E</sub> F	21 19 16 21 24 23 32 24 33 24 55 34	4 5	26	20	
255	6	I	e	22 22 00				End overtaken by following earthquake.
256	6-7	Iu	e S L M <sub>N1</sub> M <sub>N2</sub> M <sub>N3</sub> M <sub>N4</sub> F	22 34 22 50 41 23 22 37 39 46 55 44 0 01 26 08 30 51	19 26 20 18	21 21 26 28		Peru.
257	7	Ir	eP L M <sub>N</sub> F	14 42 23 46 37 46 53 15 12	13	21		
258	8	Id	eP F	4 58 14 5 02				
259	9	Id	eP F	9 27 55 50				
260	10	Id	eP F	23 54 28 57				
261	11	Ir	e L M <sub>N1</sub> M <sub>N2</sub> F	6 30 56 35 50 42 19 50 53 8 09	11 7	37 79		
262	13	Ir	e F	4 31 18 5 14				
263	13	I	e F	8 32 43				
264	14	I	e F	14 36 24 15 24				
265	15	I	eP F	19 08 22 43				
266	16	Iv	eP L M <sub>N</sub> M <sub>E</sub> F	16 40 11 40 28 40 30 40 30 44	0.5 0.5	233	250	Near west coast of Luzon.
267	18	Id	eP F	4 11 30 15				
268	18	I	e F	4 19 16 5 16				
269	18	I	e F	6 38 06 7 06				
270	19	I	e F	5 08 34				
271	23	Iv	eP L M <sub>E</sub> M <sub>N</sub>	2 10 44 11 11 12 03 12 14	4 5	295 441		Benguet (W of Luzon).—End overtaken by following earthquake.

## Records of the microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
272	23	III <sub>v</sub>	eP L	<i>h. m. s.</i> 2 15 53 16 16				Benguet (W of Luzon).—Maximum not recorded owing to the amplitude of the shock throwing the pens off the record. End overtaken by following earthquake.
273	23	I <sub>d</sub>	eP F	2 41 01 45				
274	23	I <sub>v</sub>	eP F	3 12 20 17				Benguet (W of Luzon).
275	23	I <sub>v</sub>	eP F	17 58 32 18 02				Benguet (W of Luzon).
276	24	I <sub>v</sub>	eP F	1 53 08 58				Benguet (W of Luzon).
277	24	I <sub>v</sub>	eP L M <sub>N</sub> F	2 20 01 20 23 20 40 29	0.5	74		Benguet (W of Luzon).
278	24	I <sub>v</sub>	eP F	4 34 22 35				Benguet (W of Luzon).
279	24	I <sub>v</sub>	eP L M <sub>E</sub>	6 57 07 57 36 58 19	3		38	Benguet (W of Luzon).—End overtaken following earthquake.
280	24	I	e F	7 01 20				
281	24	I <sub>v</sub>	eP F	12 47 32 54				Benguet (W of Luzon).
282	25	I <sub>v</sub>	eP L M <sub>E</sub> M <sub>N</sub> F	0 11 27 11 52 11 54 11 58 17	0.5 0.5	141 206		Benguet (W of Luzon).
283	26	I <sub>v</sub>	eP L M <sub>E</sub> F	0 57 58 58 21 58 46 1 01	0.5		23	Benguet (W of Luzon).
284	27	I <sub>v</sub>	eP F	12 12 16 17				Benguet (W of Luzon).
285	27	I <sub>v</sub>	eP L M <sub>E</sub> F	20 56 45 57 11 57 25 21 00	0.5		28	Benguet (W of Luzon).
286	27	I <sub>d</sub>	eP F	23 41 00 43				
287	28	I <sub>v</sub>	eP L M <sub>E</sub> F	21 19 09 20 05 20 24 27	2-3		31	Batag (NE of Samar).
288	29	I <sub>v</sub>	eP F	17 13 28 17				Benguet (W of Luzon).
289	29	I <sub>d</sub>	eP F	20 34 00 36				
290	30	I <sub>v</sub>	eP L M <sub>N</sub>	4 04 48 05 35 06 27	9	197		NE coast Masbate.
291	31	I	e F	6 18 35				From the Horizontal Pendulums.
292	31	I <sub>r</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	17 18 34 26 20 28 38 29 02 18 10	9-10 9-10	44	46	

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

8, 3<sup>h</sup> 48<sup>m</sup> [8, 11<sup>h</sup> 48<sup>m</sup>]. Gubat (SE de Luzón). Temblor oscilatorio, dirección N-S, intensidad III.

16, 16<sup>h</sup> 40<sup>m</sup> 11<sup>s\*</sup> [17, 0<sup>h</sup> 40<sup>m</sup> 11<sup>s</sup>]. Dagupan (W de Luzón). Temblor de tierra de intensidad III. El origen de este temblor, según lo registrado por los seismógrafos del Observatorio, se halla en el Mar de la China al W de las costas de Zambales: lo intempestivo de la hora hizo sin duda que no se diesen cuenta de él en muchas otras poblaciones, donde debió ser igualmente perceptible que en Dagupan.

22, 16<sup>h</sup> 03<sup>m</sup> [23, 0<sup>h</sup> 03<sup>m</sup>]. Butuán (N de Mindanao). Temblor oscilatorio, dirección NE-SW, intensidad III.

26, 20<sup>h</sup> 03<sup>m</sup> [27, 4<sup>h</sup> 03<sup>m</sup>]. Butuán (N de Mindanao). Temblor oscilatorio, dirección SW-NE, intensidad IV-V, duración unos 15 segundos.

26, 20<sup>h</sup> 20<sup>m</sup> [27, 4<sup>h</sup> 20<sup>m</sup>]. Dumaguete (SE de Negros). Temblor oscilatorio, dirección ESE-WNW, intensidad IV, duración 10 segundos.

28, 21<sup>h</sup> 19<sup>m</sup> 9<sup>s\*</sup> [29, 5<sup>h</sup> 19<sup>m</sup> 9<sup>s</sup>]. Batag (NE de Sámar). Temblor oscilatorio, dirección N-S, intensidad III, duración 3 segundos.

30, 4<sup>h</sup> 04<sup>m</sup> 48<sup>s\*</sup> [30, 12<sup>h</sup> 04<sup>m</sup> 48<sup>s</sup>]. SE de Luzón, NW Sámar y Masbate.—Temblor de tierra de intensidad III-IV: su epicentro parece se hallaba al NE de la isla de Masbate.

30, 16<sup>h</sup> 30<sup>m</sup> [31, 0<sup>h</sup> 30<sup>m</sup>]. Butuán (N de Mindanao). Temblor oscilatorio, dirección SE-NW, intensidad III, duración muy corta.

30, 20<sup>h</sup> 16<sup>m</sup> [31, 4<sup>h</sup> 16<sup>m</sup>]. Davao (SE de Mindanao). Temblor oscilatorio, dirección SSW-NNE, intensidad IV, duración 4 segundos.<sup>2</sup>

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.

<sup>2</sup> De los terremotos de Benguet se trata en otra parte.



## THE BENGUET SEISMIC PERIOD, AUGUST 23-SEPTEMBER 26, 1913.

At 2<sup>h</sup> 10<sup>m</sup> 44<sup>s</sup> [10<sup>h</sup> 10<sup>m</sup> 44<sup>s</sup>] of August 23, there was a violent earthquake (intensity VII) at Baguio, which began in the Benguet territory, a seismic period which lasted till September 26. This shock had been preceded by a number of weak microseismic movements which were recorded only by the microseismographs installed in the observatory of Baguio between 6 and 11 o'clock Greenwich time (14 and 19 o'clock local time).

As may be seen in the following notes all the earthquakes of this period were of a purely local nature, for only the more intense shocks, which occurred for the most part on the 23d and 24th of August and the 4th and 6th of September, were felt beyond the limits of that small province.

**Geographical conditions of Benguet.**—The subprovince of Benguet is situated in the southern part of an extensive region of northern Luzon, which takes in almost the whole of the Central Cordillera, called the Mountain Province, inhabited almost entirely by non-Christian tribes.

The southern portion of this province, known as the subprovince of Benguet, is a prolongation or ramification of the Central Cordillera which extends to the S and forms a sort of mountainous plateau over 1,000 meters above the level of the sea. Mount Santo Tomas, 2,258 meters high, is the southern boundary. The NNE face of this mountain descends sharply to the Baguio plateau, which extends some 10 kilometers in the E-W direction, and somewhat less from N to S at a mean height of 1,400 meters. Continuing to the NNE, the ground is very broken and gradually falls till it joins the Central Cordillera close to the boundary line between Benguet and the subprovinces of Ifugao and Lepanto. To the E of the Benguet territory there opens out the deep valley of the Agno River to the excavating action of which is probably due the partial separation of this territory from the rest of the Cordillera and its isolation on the S, E, and W. The Agno Valley forms one of the most characteristic physiographical lines of northern Luzon, and it is extremely difficult to consider it as the result of mere erosion. On the W, Benguet descends sharply to the narrow valleys which lie between it and various small ranges parallel to the coast of the China Sea, which is only some 23 kilometers distant in a straight line from the Baguio plateau.

The whole region is well worth study on account of its geological structure. Its final elevation is, without doubt, recent, to judge from the coral beds which are found at an elevation of more than 1,500 meters, and probably dates from the so-called Miocene revolution.<sup>1</sup> Along the western side, chalk, limestone, and clay formations dominate, while the E is of andesite formation. Gold and other metals are abundant in this part, but the W of the region is apparently quite devoid of minerals.

These two formations so geologically different rest on sedimentary, shale, and sandy strata, which in the central part of the plateau are on a base of lower andesite and more or less altered diorite, while on the flanks or sides of the anticlinal fold is superimposed a cap of conglomerate. Such appears to be the order of the strata at the time of the elevation of this region before erosion and other phenomena altered it.<sup>2</sup>

**Meizoseismic area of the earthquakes.**—According to the data that have come to hand, it is quite clear that the earthquakes of August and September had their origin within the confines of Benguet itself, the meizoseismic area extending to a great part of the province and its immediate slopes. The form of the area appears to have been very much prolonged in the NNE direction, and the central line must have passed to the W

<sup>1</sup> The Philippine Journal of Science, Vol. VI, No. 6, pages 429-435.

<sup>2</sup> Cf. Op. cit.

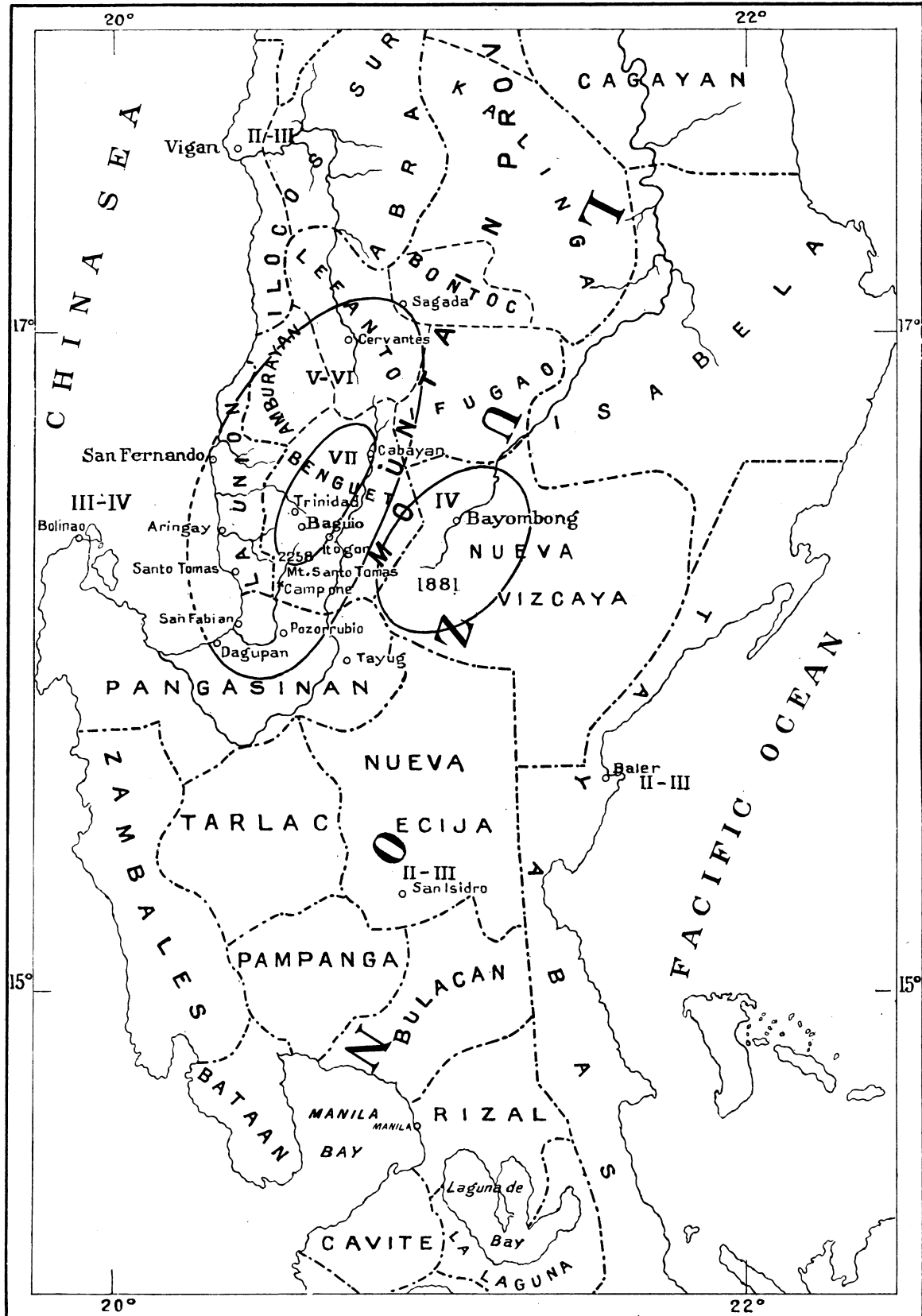
of the division between the sedimentary and igneous formations, thus remaining almost entirely within the chalk and limestone zones.

As the subprovince of Benguet is, with the exception of Baguio, inhabited entirely by non-Christian tribes, it was impossible to obtain concrete information from any part of the region except Baguio itself, which is situated in the extreme S of the meizoseismic area. Nevertheless, the prolonged narrow form of the area can be deduced from data received from some of the principal stations not far from the province, viz, Cervantes (Lapanto), 66 kilometers in a straight line to the NNE of Baguio; San Fernando (Union), 39 kilometers to the NW; Dagupan (Pangasinan), 48 kilometers to the SSW; and Bayombong (Nueva Vizcaya), 52 kilometers to the ENE.

The intensity of the shocks in Cervantes and San Fernando was the same (VI) and in both places there were more repetitions than in any other locality outside the Benguet territory. In Dagupan the intensity was scarcely greater than V of the Rossi-Forel scale and there were far less repetitions than in Cervantes, while in Bayombong only two or three shocks were felt during the morning of the 23d, all of them light (III-IV) and one on September 4, somewhat stronger. If the different positions and the relative distances of Cervantes and San Fernando be taken into account, it is necessary to suppose that the meizoseismic area was greatly extended in the direction of Cervantes or to the NNE of Baguio, otherwise the intensity there should have been less than in San Fernando, unless it is supposed that the mountain range had an extraordinary influence in facilitating the propagation of the seismic waves to the N. The comparison between Dagupan and Bayombong would also seem to show that the meizoseismic area was prolonged more to the SSW than to the ENE. At least the great difference of intensity between these two stations is very notable, in that their respective distances from Baguio only differ by about 3 kilometers. The data from other less important stations in the N, W, and S of Benguet are in perfect agreement with those from the four stations mentioned above. On the other hand, the more or less vague reports that were published concerning the earthquakes with reference to the northern part of the subprovince of Benguet, all go to prove that the shocks as far N as the border, were as intense as in Baguio; and the notes sent us by the chief of the Constabulary in Baguio, regarding the earthquakes felt in a ranch half way between Baguio and Bontoc, confirm the same impression.

Hence the statement that the meizoseismic area was prolonged in a NNE direction and comprehended the greater part of the plateau which constitutes the subprovince of Benguet, or from Santo Tomas Mountain in  $16^{\circ} 20' N$  to  $16^{\circ} 40'$  as given in the accompanying map, is not without foundation.

**Number and intensity of the earthquakes.**—The list below contains all the seismic movements registered and felt in the Baguio Observatory during the seismic period, together with their respective intensities, according to the Rossi-Forel scale. Although, as has been said, Baguio is situated in the extreme south of the meizoseismic area, nevertheless it is thought that the list represents approximately all the shocks that occurred throughout the area. The effects of the more intense shocks, i. e., those of August 23 and September 4 represent in Baguio the intensity VII of the scale; for they consisted of the falling of objects within the houses, the fall of chimneys and the production of small secondary cracks in walls and the cracking and breaking away of coating of walls. Fissures in the ground were not observed, and though several landslides took place about the same time and actually coincided with the first earthquakes, nevertheless these slides were no doubt prepared by the heavy rainfall that preceded the shocks and as they occur almost every year during the rainy season, we do not think that they can be considered as a principal effect of the intensity of the earthquakes. The same may be said with regard to the sudden sinking of a stretch of ground in the S of Baguio for



Map showing some isoseismals of the Benguet earthquakes.

about a meter, for this subsidence began in the autumn of 1912 and has gone on ever since, sometimes at a rate of 5 or 6 inches a day. This subsidence has already destroyed one of the buildings of the civil hospital and threatens to make others uninhabitable. From the rest of the Province of Benguet to the N, there are only vague reports that in Cabayan and other ranches some Igorot houses collapsed, but nothing of fissures in the ground or of the breaking of the rock-faced terraces which are so common along the mountain sides for the formation of rice paddies. Consequently there are no indications that the shocks in the N were of greater intensity than in Baguio. Nevertheless, to judge from what happened in Cervantes and Sagada, which are outside the province, that intensity cannot have been less than in Baguio. Hence, the maximum intensity of the earthquakes was VII of the Rossi-Forel scale in Baguio and very probably also in the NNE along the elevated zone which constitutes the subprovince of Benguet.

Only two of the earthquakes were of force VII, namely those of August 23 and September 4; the first, however, was a double one, for within the space of five minutes there were two series of shocks of the same intensity with several others of less force so that from 2<sup>h</sup> 9<sup>m</sup> to 2<sup>h</sup> 17<sup>m</sup> there were seven distinct shocks; between 2<sup>h</sup> 17<sup>m</sup> and 3<sup>h</sup> eight more were felt. During the following hour, 3 to 4 o'clock, there were nine, one of which had force VI and another force V; from 4 to 5 there was a lull and then came another series of shocks but decreasing in frequency and intensity as time went on, the total for the 14 hours being 36 perceptible earthquakes ranging in intensity from III to VII.

The earthquakes of September 4 occurred between 10<sup>h</sup> 42<sup>m</sup> and 11<sup>h</sup> 57<sup>m</sup>, there being nine series of shocks in this time, the strongest taking place at 11<sup>h</sup> 46<sup>m</sup>.

From the manner in which the two horizontal seismograph pendulums of the Baguio Observatory were put out of gear and from the reports of the persons who felt the earthquakes, it is deduced that they were of a vertical character and very much in the form of sudden jerks. On the other hand, the reports from Cervantes and Dagupan to the N and SSW, respectively, of Baguio note that there were felt oscillations of wide amplitude coming apparently from the S in Cervantes and from the N or NNE in Dagupan.

It is well to note that not only was there no news in Cervantes of what had happened in Baguio, but there were also persistent rumors that the shocks had their origin in Mount Data less than 20 kilometers distant to the SE and the people were persuaded that the mountain was about to break forth in violent eruption.

NUMBER AND INTENSITY OF THE EARTHQUAKE SHOCKS REGISTERED AND FELT IN THE OBSERVATORY OF BAGUIO DURING AUGUST AND SEPTEMBER, 1913.

Date.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	Total.
Aug. 23	30	6	16	13	2	4	1		72
24	15	0	2	1	3	3			24
25	14	1	1						16
26	10	0	0	1	1				12
27	44	2	1						47
28	8	0	0	0	1	1			10
29	2								2
30	5	0	1	1					7
Sept. 1	3								3
2	0	0	2	1					3
3	0	0	1						1
4	3	6	1	1	2	2	1		16
5	0	0	3						3
6	7	1	0	1	1	1			11
7	18	0	1						19
8	17	2	0	2					21
9	21	1	1	0	1				24
10	15	0	0	1					16
11	1								1
17	15								15
18	6								6
19	5								5
20	2								2
21	3								3
25	1								1
26	8								8

**Local character of the Benguet earthquakes.**—The greater number of the perceptible shocks occurred in groups, as usually happens in earthquakes of little extension or intensity, but without any correlation with determined hours of the day and night. Examining the list of earthquakes given above it will also be seen that no correlation appears to exist between the daily number of perceptible and the nonperceptible or instrumental shocks. Moreover, the extension of the perceptible seismic waves, outside the meizoseismic area was extraordinarily reduced: To the N, W, and S the width of the zone of intensity V–VI was not greater than 30 to 35 kilometers, while to the E and SE it was much narrower, for it only extended to the River Agno less than 20 kilometers away. This supposition is confirmed not only by the data from Bayombong, but also from the reports received from Itogon, where, according to the notes received from the Constabulary, the greater number, not all, of the Baguio earthquakes were felt. Itogon is situated some 7 kilometers to the SE of Baguio on one of the tributaries of the Agno which flow from the plateau to a level some 700 meters lower down.

The zones corresponding to the intensities IV, III, and II, all together did not extend for more than 100 kilometers in the more favorable directions N, W, and S. We have not enough data to determine these zones with more accuracy and as it is not of any great importance no special trouble was taken to obtain them; but in any case the zones must have been very irregular, as the V–VI zone was. What is certain is that they were not equally extensive in the two series of earthquakes; in that of August 23 the zone of perceptibility extended as far as Vigan, the capital of Ilocos Sur, thus reaching a distance of 100 kilometers to the NNW; for the S there is no datum to show that it extended to an equal distance in this direction. In the earthquakes of September 4, just the opposite happened, the zone of perceptibility extended as far as Bolinao to the SW, San Isidro to the SSE, and Baler to the SE, thus extending in these southern directions 100 kilometers, while for the N there is nothing to show that they were felt in Ilocos, Isabela, or in the northern part of the Mountain Province. In both cases the radius of perceptibility appears to have been extremely short toward the E, as if the deep Agno Valley had had some influence in deadening the shocks.

The best proof, however, of the small extension of the seismic waves, and hence of the small depth of their origin, is the fact that in Manila, some 260 kilometers from Baguio, the best microseismographs did not register more than 30 of the more intense Benguet shocks, a number which represents only 40 per cent of the earthquakes from III to VII, both included. At a distance of 1,000 kilometers to the N is the observatory of Taihoku (Formosa) where only the two more violent shocks, those, namely, of August 23 and September 4, were recorded; these same two were also recorded, although incompletely, in Zikawei, some 700 kilometers further away than Taihoku. Nothing seems to have been registered in Tsingtau (China) or in Osaka (Japan), but there are traces of them in the registers of Irkutsk, close to Lake Baikal, a little more than 4,000 kilometers away.

**Conclusion.**—The seismic period of Benguet has many points of resemblance with another that took place in the neighboring Province of Nueva Vizcaya in 1881: it is true that this latter was of incomparably more importance both on account of its duration, for it lasted with small interruptions from January to October, and on account of the violence and number of the earthquakes. The maximum activity of the Nueva Vizcaya period occurred in the months of August and September—that is, at the end of the rainy season, as in Baguio—but the principal analogy in both cases is the local character of the earthquakes. This feature of the Nueva Vizcaya earthquakes together with other data concerning their shallow character, which Señor Abella collected and

published in 1884<sup>1</sup> was the determining factor why in a recent work we considered these earthquakes to be due, not to volcanic action, as that author supposes, but to underground rockfall and secondary faults, so peculiar to that province. In the same work we further said that similar earthquakes were liable to occur in the Mountain Province, but without suspecting that an important seismic period would occur so soon to confirm our theory.

With regard to the geological constitution of the Province of Nueva Vizcaya, it may be said to be almost entirely unknown; nevertheless its extraordinary physiographical conditions have induced various seismologists, both national and foreign, to consider it as very unstable. It is situated on a branch of the Sierra Madre or eastern range of Luzon, which first twists to the W and then to the N to form the central range; all its waters flow to the N in the direction of the Cagayan Valley. A great part of the province is therefore an irregular tableland from 300 to 1,000 meters high, bordered on the S and W by a series of mountains whose outer slopes form a kind of vertical wall on the central plain of Luzon and the Agno Valley which separates it from Benguet.

With regard to the subprovince of Benguet, it is necessary to add that in the W or the zone of shale and chalk, there are and have been frequent subsidences of large tracts of land, owing no doubt to the dissolving of the limestone by subterranean water courses. The subsidence that is actually taking place to the S of the town of Baguio has already been mentioned and there is also information concerning another important subsidence that is taking place, since three or four years ago near Sagada in the subprovince of Bontoc whither the same sedimentary formations extend. In the W part of the Baguio Plateau at every pass are found valleys and depressions more or less extensive at the bottom of which the water flows away through cracks and holes in the limestone. Within the town of Baguio itself there is a moderate-sized valley which the municipality intended to turn into a lake by closing the hole by which a large amount of the water which collects in the valley escapes. Part of the water of the river which traverses the Trinidad Valley escapes when in flood, under the hills which form its eastern side. Gully holes of less import are to be found in such great numbers all around the high ground on which the observatory in Baguio is built, that 10 were counted in a space of some 45 hectares. There is no doubt, therefore, that a great part of this region is undermined by subterranean currents, which, as they are the cause of the slow subsidences visible on the surface, may well cause sudden invisible cracks which manifest themselves with earthquakes of more or less intensity but of very limited extension like the ones of August and September.

Some idea of the subterranean torrents which must necessarily exist may be formed when it is remembered that the annual rainfall in Baguio is about 4,000 mm. and that frequently during July and August the monthly rainfall is over 1,000 mm; in July, 1911, 1,168 mm. of rain fell in 24 hours.

As the subterranean hydrology of this region has not been studied, it is not known to what depth the subterranean currents exercise their erosive and dissolving influence.

In the S of Baguio, along the deep canyon through which the Bued River flows and away from the zone of sedimentaries, there are numerous springs which spout out at a level hundreds of meters below the Baguio Plateau, and one in particular which, on account of the abundance of water appears almost like a true river, emerges a thousand meters below the plateau. On the western side, too, there must be even more numerous and abundant outlets of subterranean waters.

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<sup>1</sup> Terremotos de Nueva Vizcaya en 1881.—Madrid 1884.

What has been said does not pretend to prove that precisely the recent Benguet earthquakes were the result of the subterranean currents, but we wish simply to present the conditions of the territory so that experts may resolve the question. We know perfectly well that practically all seismologists admit the principle of subsidence earthquakes, still very few cases have been actually proved, and we would not have insisted so much on this point were it not for the importance which the eminent seismologist, G. Agamennone, gave to subterranean erosion for certain specified regions of Italy, in a lecture which he delivered during the first meeting of the International Association of Seismology at La Hague in October, 1907.<sup>1</sup>

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<sup>1</sup> Comptes Rendus—Conference I, Pag. 176.





## PERÍODO SÉISMICO DE BENGUET DEL 23 DE AGOSTO AL 26 DE SEPTIEMBRE DE 1913.

A 2<sup>h</sup> 10<sup>m</sup> 44<sup>s</sup> [10<sup>h</sup> 10<sup>m</sup> 44<sup>s</sup>] del día 23 de Agosto, sin haber precedido más que algunos muy débiles choques microsísmicos, registrados por los aparatos del observatorio de Baguio entre 6<sup>h</sup> y 11<sup>h</sup> T. de G. (14<sup>h</sup> y 19<sup>h</sup> T. L.) del 22, un violento terremoto (intensidad VII) inició en el territorio de Benguet un período sísmico, el cual puede decirse duró hasta el 26 de Septiembre. Como podrá verse en las notas siguientes todos los temblores de este período fueron de carácter muy local, haciéndose sentir fuera de los límites de la pequeña provincia solamente los más intensos, ocurridos en su mayor parte los días 23 y 24 de Agosto y el 4 y 6 de Septiembre.

**Condiciones geográficas de Benguet.**—La subprovincia de Benguet ocupa la parte meridional de una extensa provincia del N de Luzón, que por comprender casi toda la Cordillera Central, lleva el nombre de Montañosa, y está totalmente poblada de tribus no cristianas, o no civilizadas. Dicha parte meridional conocida con el nombre de subprovincia de Benguet, es una prolongación, o mejor, un apéndice o ramificación de la Cordillera Central, que se extiende hacia el S y forma una especie de plateau muy montañoso de más de 1,000 metros de elevación media sobre el nivel del mar. La gran montaña de Santo Tomás, de 2,258 metros de elevación, constituye su extremo meridional: el lado NNE de esta montaña descende rápidamente hasta el plateau de Baguio, el cual se extiende unos 10 kilómetros en la dirección E-W y algo menos de N a S, a una altura media de 1,400 metros. Continuando hacia el NNE el terreno es muy escabroso y disminuye muy paulatinamente de altura, formando una faja montañosa que por fin se fusiona con la Cordillera Central, cerca ya de los límites de Benguet con las subprovincias de Ifugao y de Lepanto. Al E del territorio de Benguet se abre el profundo valle del Río Agno, a cuya excavación se debe sin duda la parcial separación de dicho territorio del resto de la Cordillera Central y su actual aislamiento por el S, E y W. El Valle del Agno constituye una de las líneas fisiográficas más características del N de Luzón, y se hace difícil el considerarlo como mero resultado de la erosión. Por el W el terreno de Benguet descende también rapidísimamente hacia diferentes valles encerrados entre él y varias pequeñas cordilleras paralelas a la costa del mar de la China, la cual en línea recta dista tan solo unos 23 kilómetros del borde occidental del plateau de Baguio.

Esta región es además muy digna de estudio por su constitución geológica aparente. Su última emergencia es sin duda reciente a juzgar por el estado de los bancos madreporicos que se encuentran a más de 1,500 metros de elevación; probablemente data de la llamada Revolución Miocénica.<sup>1</sup> A lo largo de su parte occidental dominan las formaciones calcáreas, y las arcillas mientras que la oriental es andesítica; aquélla parece ser mineralmente estéril mas en ésta abunda el oro y otros metales. Las dos mencionadas formaciones geológicamente tan distintas descansan, sobre terrenos sedimentarios, pizarras y areniscas, los cuales en la parte central del plateau reposan sobre la base primitiva de andesita y de diorita más o menos alterada, mientras que en los flancos o lados del arco anticlinal se interpone una capa de conglomerado. Tal parece sería el orden probable de las capas al tiempo de la emergencia de esta región, antes que la erosión y otros fenómenos lo modificasen.<sup>2</sup>

**Área meizosísmica de los terremotos.**—Según los datos que poseemos no hay duda que los terremotos de Agosto y Septiembre tuvieron su origen dentro de los límites de Benguet, extendiéndose su área central o meizosísmica a gran parte de la provincia y sus inmediatos declives. Su forma parece era muy prolongada en la dirección NNE, y su línea central debía pasar por el W de la división entre las formaciones sedimentarias y las ígneas, quedando así enteramente dentro de la zona de las calizas y arcillas.

<sup>1</sup> The Philippine Journal of Science, Vol. VI, No. 6, pages 429-435.

<sup>2</sup> Opus cit.

El estar la subprovincia de Benguet poblada en su totalidad de tribus no cristianas y no existir por consiguiente en ella más población civilizada que la de Baguio hace que solamente tengamos datos concretos de esta población, la cual está situada hacia el extremo S del área meizoséismica: con todo juzgamos que su forma prolongada y relativamente estrecha puede deducirse de las notas recibidas de algunas principales estaciones poco distantes alrededor de la expresada provincia.

Escogeremos las de Cervantes (Lepanto), que en línea recta dista de Baguio unos 66 kilómetros hacia el NNE; San Fernando (Unión), 39 kilómetros al NW; Dagupan (Pangasinán), 48 kilómetros al SSW; y Bayombong (Nueva Vizcaya), 52 kilómetros al ENE.

La intensidad de los terremotos fué casi igual (VI) en Cervantes y San Fernando y en ambas localidades, se contaron más repeticiones que en ninguna otra de fuera del territorio de Benguet. En Dagupan la intensidad apenas pasó del grado V, y se anotaron muchas menos repeticiones: mientras que en Bayombong solamente se sintieron dos o tres temblores la mañana del 23, calificados de ligeros (III-IV), y uno el 4 de Septiembre algo más fuerte. Teniendo en cuenta las diferentes posiciones y distancias relativas de Cervantes y San Fernando es preciso, que el área meizoséismica se extendiese mucho en la dirección de Cervantes, o sea hacia el NNE de Baguio, de lo contrario la intensidad habría sido menor allí que en San Fernando. A no ser que atribuyamos a la cordillera una influencia extraordinaria en facilitar la propagación de las ondas séismicas hacia el N. De la comparación entre Dagupan y Bayombong también se deduce lógicamente que dicha área se extendía más hacia al SSW que hacia el ENE. Es ciertamente muy notable la gran diferencia de intensidad entre estas dos estaciones, siendo así que sus respectivas distancias de Baguio sólo difieren en unos 3 kilómetros. Con los datos de estas cuatro estaciones concuerdan perfectamente los de otras menos importantes situadas al N, W y S de Benguet. Por otra parte todas las noticias más o menos vagas que se publicaron acerca de los terremotos, referentes a la parte N de la subprovincia de Benguet, indican que fueron igualmente intensos que en Baguio hasta cerca de su límite septentrional: y en unas notas que agradecemos al Jefe de los Constabularios de Baguio, se cita lo experimentado en una ranhería o pueblo situado a medio camino entre Baguio y Bontoc en confirmación de lo mismo. No es por consiguiente infundado el extender el área meizoséismica en la dirección NNE, a la mayor parte del plateau que constituye la subprovincia de Benguet o sea desde los macizos montañosos de Santo Tomás, 16° 20' N, hasta los 16° 40' N, según se halla indicado en el mapa que acompaña; en él figuran tan sólo las poblaciones y ranherías de que tenemos datos.

Número e intensidad de los terremotos.—La lista que insertamos más abajo (véase el texto inglés) nos da todos los movimientos sísmicos registrados y sentidos en el Observatorio de Baguio durante todo el período con sus respectivas intensidades; y aunque, según se dijo, Baguio está situado hacia el extremo sur del área meizoséismica creemos representa con aproximación lo ocurrido en toda ella. Los efectos de los terremotos más intensos, del 23 de Agosto y 4 de Septiembre, correspondieron realmente en Baguio al grado VII de la escala; puesto que consistieron en la caída general de objetos dentro de las casas, derrumbe de alguna chimenea, y la producción de pequeñas grietas secundarias y desprendimiento de porciones del revestimiento en las paredes. No se observaron grietas en el suelo; varios desprendimientos en los montes, que ocurrieron aquellos días, seguramente estaban ya preparados por los grandes aguaceros que precedieron y aún coincidieron con los primeros terremotos, y así por ser allí cosa ordinaria de todos los años en la época de lluvias, no creemos puedan considerarse como efecto principal de intensidad de los terremotos. Lo mismo debe decirse, del súbito hundimiento y resbalamiento de cerca de un metro ocurrido en una extensión de terreno al S de la población de Baguio, que comenzó a hundirse el otoño de 1912 y ha continuado así desde entonces,

a razón, durante algunos períodos, de 5 y 6 pulgadas diarias. Este hundimiento derumbó ya uno de los edificios del hospital civil y amenaza inutilizar otros. Del resto de la Provincia de Benguet hacia el N sólo se sabe vagamente que en Cabayan y en otras rancherías se cayeron varias casas de igorotes; nada sin embargo se ha dicho de grietas en los terrenos ni de derrumbamientos en las terrazas de piedra, que para el cultivo del arroz, tanto abundan en las empinadas laderas de las montañas de esta región. Por consiguiente no hay indicios de que los terremotos tuviesen hacia el N mayor intensidad que en Baguio; tampoco sin embargo la debieron tener menor a juzgar por la que aún conservaban en Cervantes y Sagada, fuera ya de la provincia. En conclusión; la máxima intensidad de los terremotos fué del grado VII en Baguio y con mucha probabilidad hacia el NNE a lo largo de la zona elevada que constituye la subprovincia de Benguet.

Los terremotos de intensidad VII fueron solamente dos, uno el 23 de Agosto y otro el 4 de Septiembre; el primero sin embargo puede decirse que fué doble, pues que en el espacio de 5 minutos se sintieron dos series de choques de la expresada intensidad, con otros menos intensos, hasta el número de 7 durante los 8 primeros minutos, o sea desde 2<sup>h</sup> 9<sup>m</sup> a 2<sup>h</sup> 17<sup>m</sup>. De 2<sup>h</sup> 17<sup>m</sup> a 3<sup>h</sup> se sintieron otros 8, dos de ellos de intensidad VI. Durante la siguiente hora, de 3<sup>h</sup> a 4<sup>h</sup>, se contaron 9, entre ellos uno de intensidad V y otro de intensidad VI. La hora siguiente, 4<sup>h</sup> a 5<sup>h</sup>, fué de calma; luego después volvieron a repetirse algunos choques pero con menor frecuencia e intensidad, llegando este día el total de temblores bien perceptibles, de intensidad III a VII, al número de 36 en 14 horas. Los terremotos del 4 de Septiembre tuvieron lugar principalmente entre 10<sup>h</sup> 42<sup>m</sup> y 11<sup>h</sup> 57<sup>m</sup>, sintiéndose en poco más de una hora nueve series de choques de varia intensidad; los más fuertes ocurrieron a 11<sup>h</sup> 46<sup>m</sup>.

De las sensaciones de las personas que los experimentaron y del modo como en las citadas dos fechas se inutilizaron los péndulos horizontales del Observatorio de Baguio, se deduce que allí todos los temblores fueron de carácter vertical a manera de golpes súbitos. En cambio los reports recibidos de Cervantes y de Dagupan, al N y SSW, respectivamente de Benguet hacen notar que se experimentaban amplios vaivenes, siempre procedentes aparentemente de hacia el S en Cervantes y de hacia el N o NNE en Dagupan. Conviene advertir que en Cervantes no solo no tenían noticia alguna de lo que ocurría en Benguet, sino que corrían persistentes rumores de que el origen de los choques estaba al SE en el Monte Data, a menos de 20 kilómetros de distancia, apoderándose del vulgo la persuasión de que de dicho monte había de explotar una tremenda erupción volcánica.

**Carácter local de los terremotos de Benguet.**—Los más de los choques perceptibles ocurrieron en grupos, como suele acontecer en terremotos de poca extensión e intensidad, pero sin correlación ninguna con las determinadas horas del día o de la noche. Fijándose en la lista arriba mencionada tampoco parece existir correlación ninguna entre el número diario de los choques perceptibles y el de los instrumentales. La extensión de las ondas sísmicas perceptibles, fuera del área meizoséismica anteriormente determinada, fué extraordinariamente reducida: Hacia el N, W y S la anchura de la zona de intensidad V–VI no pasaba de 30 a 35 kilómetros; siendo muchísimo más estrecha por el E y SE. En esta dirección parece se extendía solamente hasta el Río Agno, una distancia de menos de 20 kilómetros. Esta suposición, está confirmada no sólo por los datos de Bayombong, citados más arriba, sino también por los de Itogon, donde, según uno de los reports facilitados por la Constabularia, se sintieron bien la mayor parte de los terremotos de Baguio. Itogon está situado a unos 7 kilómetros al SE de Baguio en uno de los afluentes del Agno que bajan del plateau y a un nivel 700 metros más bajo.

Las zonas correspondientes a las intensidades IV, III, II, en conjunto no se extendían más de 100 kilómetros en las direcciones más favorables N, W y S. No poseemos datos para determinarlas con alguna precisión ni los hemos procurado, por considerarlo de poca o de ninguna importancia. Seguramente serían muy irregulares como sin duda lo

fué la zona de intensidad V-VI. Lo que consta es que no fueron igualmente extensas en las dos diferentes series de temblores: en los del 23 de Agosto la zona de perceptibilidad se extendió hasta Vigan, capital de Ilocos Sur, alcanzando así por el NNW, los 100 kilómetros, más no existe dato alguno de la parte S que indique se extendiera igualmente en esta dirección. En los terremotos del 4 de Septiembre sucedió todo lo contrario, extendiéndose la zona de perceptibilidad hasta Bolinao, por el SW, hasta San Isidro por el SSE y hasta Baler por el SE, alcanzando también en estas direcciones meridionales los 100 kilómetros, mientras que de la parte N no consta se sintiesen ni en Ilocos, ni en la Isabela ni en la parte N de la Montañosa. En ambos casos el radio de perceptibilidad parece haber sido extraordinariamente corto hacia el E, como si el profundo Valle del Agno hubiera tenido alguna influencia.

La mejor prueba sin embargo de la poca extensión de las ondas sísmicas y por consiguiente de lo poco profundo de su origen la tenemos en Manila, a unos 260 kilómetros de Baguio, donde los mejores seismógrafos no registraron más que 30 de los temblores más intensos de Benguet, número que representa tan solo el 40 por ciento de los temblores de los grados III al VII, ambos inclusive. A unos 1,000 kilómetros de distancia hacia el N, existe el observatorio de Taihoku (Formosa) donde solo se registraron los dos más violentos; el del 23 de Agosto a 2<sup>h</sup> 10<sup>m</sup> 44<sup>s</sup> (10<sup>h</sup> 10<sup>m</sup> 44<sup>s</sup>) y el del 4 de Septiembre a 11<sup>h</sup> 46<sup>m</sup> 13<sup>s</sup> (19<sup>h</sup> 46<sup>m</sup> 13<sup>s</sup>): los mismos se registraron también aunque incompletamente en Zikawei, que dista unos 700 kilómetros más que Taihoku. No parece se registrase ninguno en Tsingtau (China), ni en Osaka (Japón); pero hay trazas en los registros de Irkutsk, cerca del lago Baikal, y a poco más de 4,000 kilómetros de distancia.

**Conclusión.**—El período sísmico de Benguet tiene muchos puntos de comparación con otro que tuvo lugar en la vecina Provincia de Nueva Vizcaya en 1881; es verdad que éste fué incomparablemente de mayor entidad tanto por su duración, que comprendió, con pocas interrupciones de Enero a Octubre, como por la violencia y número de los terremotos. La máxima actividad sísmica del período de Nueva Vizcaya ocurrió en los meses de Agosto y Septiembre, es decir hacia el fin de la época de lluvias, como el de Benguet. Mas la principal analogía en ambos casos es el carácter local de los temblores: esta particularidad de los terremotos de Nueva Vizcaya junto con otros muchos datos sobre su carácter poco profundo que recogió el Señor Abella en un precioso estudio,<sup>1</sup> nos determinó en un trabajo reciente a considerarlos como de origen, no volcánico, como quiere el autor citado, sino más bien debidos a hundimientos internos y fracturas secundarias y poco profundas, peculiares de aquella provincia. En el mismo trabajo añadíamos que sin duda podían también ocurrir semejantes terremotos en la Provincia Montañosa, sin sospechar que tan pronto un período sísmico importante viniese a confirmar nuestra teoría.

De la constitución geológica de la Provincia de Nueva Vizcaya puede decirse que nada se conoce; sin embargo sus extraordinarias condiciones fisiográficas han inducido a varios seismólogos nacionales y extranjeros a considerarla naturalmente muy inestable. Ocupa una desviación o ramificación de la Sierra Madre o Cordillera Oriental de Luzón, la cual tuerce primero hacia el W y luego hacia el N para formar la Cordillera Central: sus aguas vierten hacia el N en dirección al gran valle de Cagayán. Gran parte de ella por consiguiente viene a ser una meseta muy irregular de 300 a 1,000 metros de elevación, limitada al S y al O por una serie de montañas, cuyas vertientes externas forman como un muro vertical sobre la llanura central de Luzón y el valle del Río Agno, que la separa actualmente de Benguet.

Respecto de la subprovincia de Benguet, debemos añadir que en su parte W, o sea en la zona de las calizas y arcillas, son y han sido frecuentes los hundimientos de grandes

<sup>1</sup> Terremotos de Nueva Vizcaya en 1881.—Madrid, 1884.

extensiones de terreno, debidos indudablemente a la disolución de las calizas y arrastre de las arcillas por las corrientes de aguas subterráneas. Ya hemos citado más arriba el hundimiento, que actualmente tiene lugar al S de la población de Baguio; hay también datos de otro importante que hace tres o cuatro años se está verificando cerca de Sagada, en la subprovincia de Bontoc, a donde se extienden las mismas formaciones sedimentarias. A cada paso se encuentran valles y depresiones más o menos extensas, en cuyo fondo desaparecen las aguas a través de grietas y agujeros de la caliza. Dentro del mismo pueblo de Baguio existe un valle de mediana extensión, que se ha pretendido convertir en lago cerrando la gruta por donde se escapa la inmensa cantidad de agua que en él se reúne. Parte del agua del río que atraviesa el antiguo atolon llamado Valle de Trinidad, se escapa en las crecidas por debajo de la cordillera que forma su borde oriental. Los sumideros de menor entidad son en tan grande número que al rededor del collado en que está situado el observatorio de Baguio se cuentan más de 10 en una extensión de 45 hectáreas. Muchos de ellos están alineados, indicando que vierten sus aguas en una misma grieta para engrosar una misma corriente. No cabe pues duda que gran parte de esta región está grandemente subminada por corrientes subterráneas, las cuales así como son causa de hundimientos lentos, visibles en la superficie, pueden causar también importantes roturas súbitas y no visibles que se manifiesten con temblores más o menos fuertes, pero de muy limitada extensión como los últimos de Agosto y Septiembre. Podrá formarse idea de los torrentes subterráneos que necesariamente deben existir teniendo en cuenta que la cantidad anual de la lluvia en Baguio es de 4,000 mm. y que frecuentemente las cantidades mensuales de Julio y Agosto pasan de 1,000 mm.; dándose caso en Julio de 1911 de recoger 1,168 mm. en 24 horas.

Como no se ha estudiado aún la hidrología subterránea de esta región no consta hasta que profundidad las corrientes subterráneas ejercen su acción erosiva y disolvente. En la parte S de Baguio, a lo largo de la profundísima barranca por donde corre el Río Bued y fuera ya de la zona calcárea, salen numerosos manantiales a un nivel centenares de metros más bajo que el Plateau de Baguio y uno en particular que por su caudal semeja un verdadero río sale a unos mil metros: por el lado occidental deben ser aún más numerosas y abundantes las salidas de aguas subterráneas.

Con lo dicho no pretendemos probar que precisamente los últimos terremotos de Benguet sean el resultado de la acción de las aguas subterráneas; nuestra intención ha sido sólo presentar las condiciones de este territorio para que otros más peritos resuelvan la cuestión. Sabemos perfectamente que si bien todos los seismólogos admiten en principio los terremotos de hundimiento, con todo hasta ahora se han podido probar muy pocos casos: ni hubieramos insistido en esto, si no viéramos la importancia que da a la erosión subterránea para determinadas regiones de Italia el eminente Seismólogo G. Agamennone en una conferencia que dió durante la primera reunión de la Asociación Internacional de Seismología, en la Haya en Octubre de 1907.<sup>1</sup>



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## BULLETIN FOR SEPTEMBER, 1913.





# METEOROLOGICAL BULLETIN FOR SEPTEMBER, 1913.

By Rev. JOSÉ CORONAS, S. J.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

Pressure and temperature.—The mean atmospheric pressure of the month was much greater than that of September last year, though but slightly different from the normal of the month. Thus the monthly mean in Manila was greater than that of September, 1912, by 1.39 mm., while compared with the normal it was only 0.22 mm. greater. The highest pressures were observed on the 23d in Mindanao and in some stations of the Visayas, and on the 27th in the other stations of the Visayas and in Luzon. The lowest pressures occurred on the 2d in the Visayas and Mindanao, on the 3d in the center and S of Luzon and on the 4th in the N of Luzon.

The mean monthly temperature differed but slightly from that of last September, the greatest differences being  $-0.7$  and  $-0.8^{\circ}$  C. in the stations of Ormoc, Tacloban, and Calbayog. The extreme temperatures in Manila were  $33^{\circ}$  C. on the 22d, 23d, and 30th, and  $21.2^{\circ}$  C. on the 29th.

PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR SEPTEMBER, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from Sept., 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from Sept., 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		$^{\circ}$ C.	$^{\circ}$ C.	$^{\circ}$ C.		$^{\circ}$ C.	
Tagbilaran	758.29	+0.88	759.56	23	754.86	2	26.5	-0.6	32.3	8	21.5	14
Surigao	58.09	+1.15	59.52	23	53.60	2	27.4	-0.2	35.5	4	22.8	19
Cebu	58.15	+1.24	59.56	23	53.94	2	27.6	+0.1	32.9	28	23.4	3
Iloilo	58.04	+1.10	59.68	23	54.12	2	26.8	-0.1	32.5	14	21.6	5
Ormoc	58.31	+1.18	59.89	23	53.80	2	26.6	-0.7	32.8	13	21.3	26
Tacloban	57.87	+1.25	59.66	27	52.81	2	27.2	-0.7	35	11	23	14, 24, 30
Capiz	57.98	+1.34	59.60	27	53.34	3	26.8	+0.2	34.5	8	22.3	13
Calbayog	57.83	+1.41	59.53	27	52.40	2	26.8	-0.8	34.4	13	21.9	30
Legaspi	57.46	+1.38	59.62	27	51.10	3	27.5	+0.5	34.5	28	21.9	21
Atimonan	57.27	+1.46	59.71	27	50.49	3	26.9	+0.2	33.2	17	22.7	1
Ambulong, Tanauan	57.26		59.48	27	50.90	3	26.7		34.4	23	21.5	1
Paracale	57.32	+1.59	60.01	27	49.88	3	27.1	-0.3	34	17	22.1	9
Manila	57.67	+1.39	59.93	27	50.96	3	26.7	0	33	22, 23, 30	21.2	29
San Isidro	57.59	+1.35	60.32	27	50.66	3	26.3	-0.2	34	30	21.4	28
Dagupan	56.72	+0.89	59.40	27	49.03	3	26.9	-0.3	35.3	21, 28	21.5?	28
Bolinao	56.85	+1.27	59.55	27	49.49	3	26.8	0	33.6	26	22.5	28
Baguio	635.26	+1.22	637.83	27	628.04	4	17.7	+0.1	25.5	19	14	4
Vigan	756.51	+1.01	759.78	27	746.14	4	26.8	+0.3	32.8	23	22.5	16
Tuguegarao	56.32	+1.20	60.36	27	44.26	4	26.9	+0.2	35.6	6	21.5	27
Aparri	55.92	+1.18	60.12	27	41.51	4	27.2	+0.3	33	6	22.1	4, 27

<sup>a</sup> The barometric readings of this station are not reduced to sea level.

<sup>b</sup> 29 days of observation.

Rainfall.—Comparing the total rainfall of the month with that of last September and with the normal, we find that the stations to the N of Manila and Manila itself had a much greater rainfall, while in most of the stations to the south of Manila it was

less. In Manila 365.5 mm. of rain were collected, which is greater than the amount recorded in September, 1912, by 138.1 mm. and 5.7 mm. above the normal.

RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF SEPTEMBER, 1913.

Station.	Total.	Departure from Sept., 1912.	Departure from normal.	Rainy days.	Departure from Sept., 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from Sept., 1912.	Departure from normal.	Rainy days.	Departure from Sept., 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.						mm.	mm.	mm.			mm.	
Jolo	120.3	- 41.8	- 51.4	13	+ 2	25.7	20	Calapan	77.7	- 251.1	-	10	-11	36.6	10
Isabela, Basilan	217.9	+ 113.3	-	11	+ 1	64.2	1	Virac	250.7	+ 145.9	-	16	+ 5	100.6	2
Zamboanga	124.2	-	+ 23	9	+ 1	70.1	1	Nueva Caceres	203.5	- 44.9	- 51.9	17	+ 1	74	19
Davao	177.9	+ 6.9	- 22.3	15	+ 3	46.2	13	Batangas	296.1	- 102.6	-	16	- 2	91.7	11
Cotabato	278.5	+ 85.7	+ 29.9	20	+ 3	59.2	2	Atimonan	171.7	- 184.9	- 107.2	15	- 2	26.9	4
Cagayan, Misamis	110.5	+ 76.1	-	14	0	32.8	23	Ambulong, Tanauan	435.2	-	-	18	-	224.2	10
Butuan	90.7	+ 1.5	- 45.5	12	+ 6	29.2	20	Silang	252.7	- 186	-	14	- 3	48.8	9
Dumaguete	110.1	- 55.7	-	13	0	25.6	2	Paracale	231.5	- 20	-	13	- 3	47.3	2
Yap, W. Carolines	368.3	+ 40.1	-	23	- 2	49.3	1	Sta. Cruz, Laguna <sup>a</sup>	214.8	-	-	-	-	74.4	10
Tagbilaran	119	- 108	- 56.4	8	- 3	54.9	20	Manila	365.5	+ 138.1	+ 5.7	20	+ 2	128.2	10
Surigao	128.1	- 9.7	- 44.2	12	- 1	37.6	18	Antipolo	637.2	+ 242.7	-	21	- 3	203.7	9
Maasin	263.1	- 97.2	- 28.9	9	- 3	83.3	22	Iba	806.2	+ 218.6	-	25	- 3	214.5	11
Cebu	47.3	- 55.1	- 128.2	13	+ 1	12.2	21	San Isidro	301.9	- 15.2	- 36.7	20	- 1	59.3	3
Iloilo	340.4	- 28.6	+ 25.1	18	- 4	75.3	4	Tarlac	366.4	+ 50.9	+ 15.8	22	+ 1	81.3	3
San Jose Buenavista	437.9	+ 9.3	-	22	- 5	130.8	21	Baler	134.3	- 37.5	-	16	- 2	40.4	3
Cuyo	394.9	+ 58.6	-	15	- 6	153.4	4	Dagupan	934.4	+ 628.4	+ 469.3	20	- 5	316.7	3
Ormoc	482.9	+ 260.8	+ 174.4	20	+ 8	135.9	1	Bolinao	907.8	+ 556.6	+ 356.8	19	- 5	433.8	3
Tacloban	122.6	- 45.5	-	16	+ 7	31.5	22	Baguio	2108.1	+ 1358.4	+ 1243.3	27	- 1	628.8	3
Capiz	115.8	- 186.6	- 208.3	14	- 4	28.2	28	San Fernando, Union	982.6	+ 563.6	+ 539.3	20	- 6	244.4	3
Borongan	168.8	- 89.6	- 53.2	16	+ 7	38.3	2	Echague	164.8	- 132.8	-	16	- 6	46.2	3
Calbayog	134.1	- 103.2	- 153.8	14	- 1	27.9	30	Candon	1179.6	+ 837.7	-	18	- 5	254	4
Masbate	137	- 12.2	-	15	+ 5	43.7	17	Vigan	1491.1	+ 937.8	+ 949	18	- 9	393.3	3
Romblon	140.4	- 152.8	-	15	- 3	31.3	3	Tuguegarao	703.9	+ 236.3	+ 417.4	10	- 11	274.6	3
Batag	141	-	-	10	-	33.8	2	Laoag	1380.8	+ 1088.8	-	16	- 11	564.2	4
Gubat	101.5	- 78.7	-	12	- 1	24.9	18	Aparri	348.1	-	-	11	- 11	126	3
Legaspi	119.4	- 40.6	- 131	14	- 8	22.4	2	Sto. Domingo, Bata-							
Sumay, Guam	414.1	- 12.6	-	24	+ 9	69.9	18	nes	497.6	- 279.7	-	18	- 2	160.3	10

<sup>a</sup> 28 days of observation.

<sup>b</sup> Rainfall for the 15th and 16th is not included as the raingauge was submerged by the river in flood.

DEPRESSIONS AND TYPHOONS.

There were six typhoons during the month in the Far East. Two of them crossed the Philippines in the neighborhood of the Babuyan Islands close to the northern coast of Luzon. It is to be noted that one typhoon crossed the same region in August last.

The typhoon of August 29 to September 8, 1913.—This typhoon appears to have been formed on August 29–31 to the N of Yap, Western Carolines, between 13° and 14° lat. N and 138° and 139° long. E. The track followed by the storm from August 31 to the morning of September 4, when it crossed the Babuyan Islands was indicated in the following notes and warnings published by the Observatory:

August 31, 5 p. m.: A new typhoon appeared in this morning's weather map as forming to the N of Yap, Western Carolines, in about 14° lat. N. This afternoon, it appears to be moving W or WNW.

September 1, 11.30 a. m.: The typhoon was situated at 6 o'clock this morning to the E of the central part of the Philippines in about 14° lat. N and 134° long. E, moving W or WNW.

September 2, 11.30 a. m.: The typhoon was situated at 6 o'clock this morning to the E of Luzon in about 15° lat. N and between 129° and 130° long. E, moving W by N.

September 3, 11.30 a. m.: The typhoon was situated at 6 o'clock this morning to the E of northern Luzon in about 124° long. E and between 17° and 18° lat. N, moving WNW. It threatens to cross or pass very near the Cagayan Province this afternoon or this evening.

September 4, 11 a. m.: The typhoon was situated at 6 o'clock this morning in about 121° long. E and between 19° and 20° lat. N, moving to NW by W. It passed very close to the northern coast of the Cagayan Province last night.

## METEOROLOGICAL OBSERVATIONS FOR SEPTEMBER 2 to 5, 1913.

Date and hour.	Tuguegarao.				Aparri.				Santo Domingo.				Laoag.			
	Pres- sure.	Wind.		Rain- fall.	Pres- sure.	Wind.		Rain- fall.	Pres- sure.	Wind.		Rain- fall.	Pres- sure.	Wind.		Rain- fall.
		Direc- tion.	Force.			Direc- tion.	Force.			Direc- tion.	Force.			Direc- tion.	Force.	
Sept. 2:	mm.		0-12.	mm.	mm.		0-12.	mm.	mm.		0-12.	mm.	mm.		0-12.	mm.
6 a. m.-----	754.44	Calm			754.25	W		<sup>a</sup> 58.3	754.22	NE		<sup>b</sup> 5.6	753.74	Calm		<sup>b</sup> 6.9
2 p. m.-----	52.22	NW	1	<sup>c</sup> 3	52.39	N	2	8.9	52.81	NNE	4		52.28	NNE	1	
Sept. 3:																
6 a. m.-----	47.37	NW	2	189.4	47.43	NNE	5	98	49.51	N	4	<sup>d</sup> 27.9	49.11	NNE	3	<sup>d</sup> 89.7
10 a. m.-----	46.42	NW	1	66.3	46.62	N	5	10.4	48.88	N	5	3.8				
2 p. m.-----	43.70	NW	4	8.4	44	N	5	1.3	46.41	N	5		46.03	N	5	16
6 p. m.-----	42.84	NW	4	38.1	42.57	N	5	3.8	45.17	NE by N	5	21.6	44.94	N	5	13.2
10 p. m.-----	43.15	NW	3	56.6	40.46	NNW	6	14	44.89	NE	4	10.4	44.80	N	4	21.6
11 p. m.-----	42.79	WSW	5	23.1	39.75	NNW	6						43.57	NNW	5	16
12 midnight.	42.35	SW	5	14	38.94	NNW	6									
Sept. 4:																
1 a. m.-----	41.82	SW	7	21.8	37.43	NW	6						42.97	NW	6	17.5
2 a. m.-----	41.41	SW	7	4.1	37.06	SW	6	<sup>e</sup> 37.1					42.16	NW	6	30.5
3 a. m.-----	41.51	SW	7	5.6	36.34	S	6						41.99	NW	6	40.6
4 a. m.-----	41.92	SW	8	7.9	35.87	S	7						41.34	NW	6	36.8
5 a. m.-----	41.97	SW	8	16.3	36.28	S	10						41.03	WNW	6	41.4
6 a. m.-----	42.02	SW	8	12.4	36.94	SSE	10	<sup>e</sup> 59.4	42.95	ESE	5	16	40.25	WNW	6	46.5
7 a. m.-----					37.84	S	10						40.09	W	7	37.8
8 a. m.-----									43.24	ESE	6		39.97	W	7	44.4
9 a. m.-----													39.84	W	8	43.4
10 a. m.-----	44.13	SE	4	13	40.08	SSE	7	<sup>e</sup> 15	43.64	ESE	6-7	.5	40.54	WSW	9	50.8
2 p. m.-----	43.62	SSE	3	10.9	42.02	SSE	5	<sup>e</sup> 4.3	44.39	ESE	6-7	10.6	42.05	WSW	11	209
3 p. m.-----													43.02	WSW	11	53.6
6 p. m.-----	45.30	SE	3		43.96	SE	3	<sup>e</sup> 8	45.10	SE	5					
10 p. m.-----	49.11	S	3		48.99	SE	3		48.51	SE	4					
Sept. 5: 6 a. m.-----	51	S	2		50.77	SE	2		52.18	SSE	2	.2	50.15	SSW	6	152.2

<sup>a</sup> Rainfall from 1 a. m. <sup>b</sup> Rainfall from 2 p. m. <sup>c</sup> Rainfall from 1.30 p. m. <sup>d</sup> Rainfall from midnight. <sup>e</sup> Rainfall every four hours.

In the table are given the observations made during the passage of this typhoon in the stations of Tuguegarao, Aparri, Santo Domingo (Batan Islands), and Laoag. It will be seen from the observations of the last-mentioned station how torrential were the rains caused by the storm in the towns on the western coast of the northern part of Luzon. In Laoag 634.8 mm. of rain fell in 14 hours—that is, from 1 a. m. to 3 p. m. of the 4th. The observer of that station reports that the water which inundated the lower part of the town was within a few inches of submerging the rain gauge. The observer of Vigan also speaks of the inundation which was general in the towns near the coast in the provinces of Ilocos Norte and Sur, and reports that this was the greatest flood in the region since 1908.

In Plate XII are published the isobars of 6 a. m. of the 4th, 5th, and 6th. From them it will be observed that the typhoon inclined to the N in the China Sea and entered the Continent close to Swatow during the morning of the 6th.

The following are the weather notes of the 6th and 7th published by the Observatory:

September 6, 11.30 a. m.: The typhoon has inclined northward since yesterday morning, while it has been partially filling up. Its center appeared in this morning's weather map very near and to the W of Swatow, moving N.

September 7, 11 a. m.: The typhoon over China continues moving northward in the form of a depression.

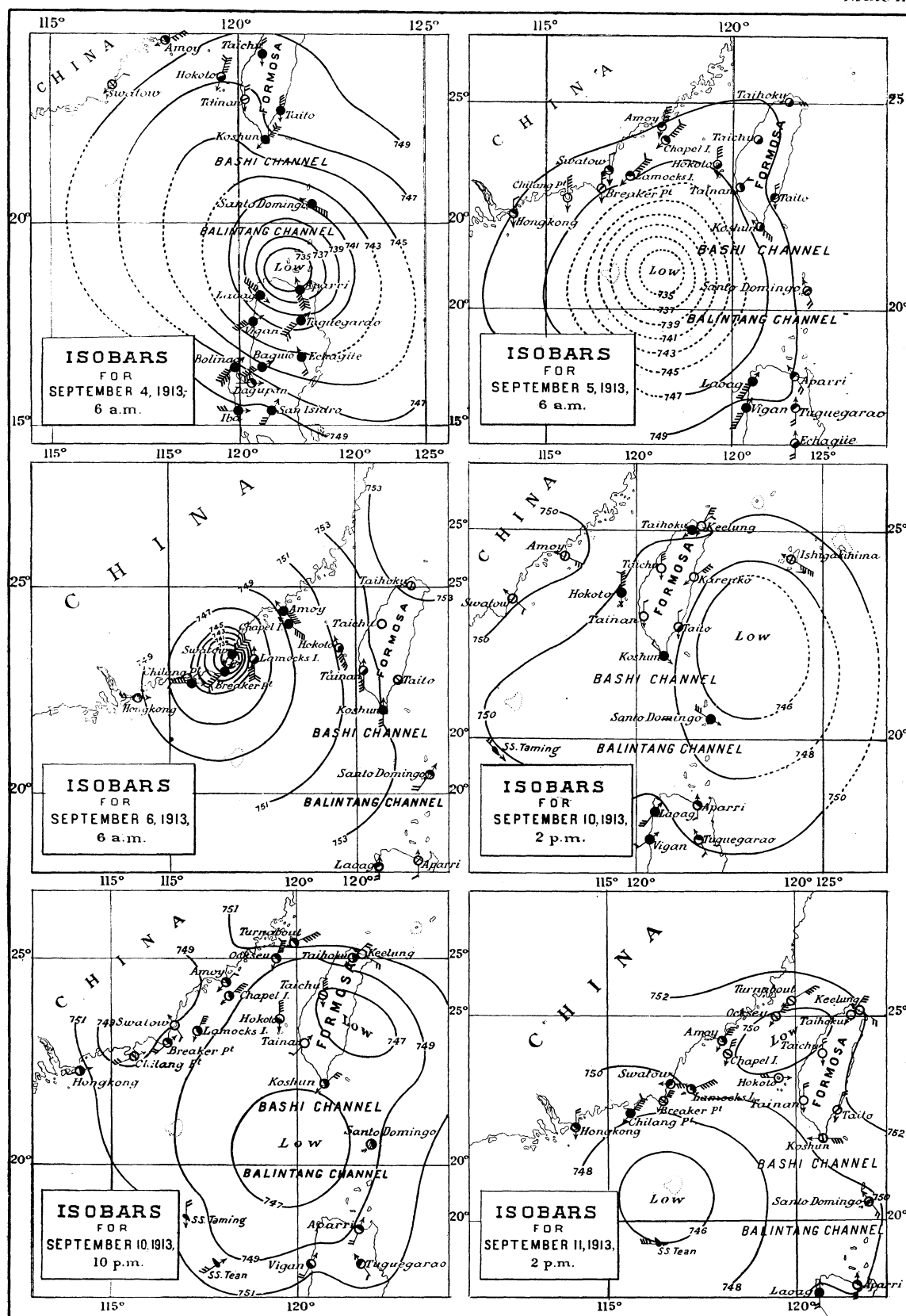
The following are the typhoon warnings transmitted as usual to the Observatories of Tokio, Zikawei, Taihoku, Hongkong, and Phulien:

August 31, 3.40 p. m.: Typhoon NW of Yap, moving W or WNW.

September 1, 8.50 a. m.: Typhoon E of southern Luzon moving W or WNW.

September 2, 9.10 a. m.: Typhoon E of Luzon, more than 300 miles distant, moving W or WNW.

September 2, 4.55 p. m.: Typhoon in about 127° long. E and 16° lat. N, moving WNW.



September 3, 8.50 a. m.: Typhoon in about 124° long. E and 17° lat. N, moving WNW.  
September 3, 10.40 p. m.: Typhoon near or over Aparri, moving WNW or NW.  
September 4, 8.30 a. m.: Typhoon NW of Aparri, moving WNW or NW.  
September 4, 3.45 p. m.: Typhoon in about 119° long. E and 20° lat. N, moving WNW.  
September 5, 9.20 a. m.: Typhoon in about 118° long. E and 20° lat. N, almost stationary.  
September 6, 11.30 a. m.: Typhoon in about 116° long. E and 24° lat. N, moving N.

From the observatory of Hongkong the following warnings were received.

September 1, 10.30 a. m.: Typhoon SE of Luzon, moving W.  
September 2, 10.20 a. m.: Typhoon SE of Luzon, moving WNW.  
September 3, 9.05 a. m.: Typhoon NE of Manila, moving NW.  
September 4, 6.35 a. m. Typhoon near Balintang Channel, moving NW.  
September 4, 11.40 a. m.: Typhoon W of Bashee Channel, moving NW.  
September 5, 10.15 a. m.: Typhoon in S part of Formosa Channel moving NNW.  
September 6, 6 a. m.: Typhoon on mainland, near Swatow, moving W.  
September 6, 10.30 a. m.: Typhoon NE of Hongkong, filling up.

The observatory of Zikawei followed the track of this typhoon by means of these telegrams sent to the stations along the China coast:

August 30, 4.30 p. m.: Typhoon N to W of Yap, within 240 miles; direction unknown.  
August 31, 4.30 p. m.: Typhoon N to W of Yap, within 240 miles; increasing.  
September 1, noon.: Typhoon far E of the Philippines; direction WNW. Another typhoon N to W of Yap; stationary.  
September 2, noon.: Typhoon E of Luzon; direction WNW.  
September 3, 10 a. m.: Typhoon E of Luzon; direction NW.  
September 3, 4.30 p. m.: Typhoon NE of Luzon; direction NW.  
September 4, 9.50 a. m.: Typhoon in Balintang Channel; direction WNW.  
September 4, 9 p. m.: Typhoon, Pratas, S of Formosa Channel; direction NW.  
September 5, 4.30 p. m.: Typhoon SE of Hongkong, beyond 120 miles; direction NW.  
September 6, 4.30 p. m.: Typhoon, coast S of lat. 25°; direction NNW.

The typhoon of September 7-14, 1913.—There were two typhoons simultaneously on the 10th and 11th of the month. The first had appeared on the 7th in the neighborhood of 19° lat. N and 134° long. E and seems to have moved first to the NW till the 9th when it went due W to pass by the S of Meiacosima on the morning of the 10th. During the afternoon of the same day it recurved again to the NW, crossed the Island of Formosa with diminished intensity and appears to have filled up on the 11th in the central part of the Formosa Channel.

While this typhoon was approaching Formosa on the 10th, the observations from Koshun (southern Formosa) and Santo Domingo de Basco (Batan Islands) gave unequivocal indications of another cyclonic center which had appeared to the W of the Balintang Channel near 120° long. E and between 20° and 21° lat. N. The fact that these observations were not received till much later by post, caused us to suppose with the observatories of Hongkong and Zikawei that the typhoon which was quite evident in the NE part of the China Sea on the 11th, was the same that had traversed Formosa the night previous, and which, once in the Formosa Channel, must have moved in a direction to the SW. Nevertheless, all the observations which have come to hand since, make this supposition quite improbable. The isobars which we give in Plate XII, clearly indicate the existence of two typhoons. The second typhoon went on traveling to the W till the afternoon of the 11th, when it curved to the WSW in which direction it continued till the morning of the 12th; it then recurved again to the W during the 12th, and crossed the Island of Hainan and the northern part of the Tongking Gulf on the 13th to the NW.

Mr. Kondo, director of the Taihoku Observatory in Formosa, forwarded to Manila

observations made in various stations of the island on the 10th and 11th together with a letter from which the following lines are copied:

My supposition is that the typhoon crossed the central part of the Island being filled up greatly when it passed the high mountain range of the Island and disappeared as soon as landed the Continent. Another depression developed on the 11th to the W of Balintang Channel moved to the S of Hongkong.

This coincides exactly with what was said above with regard to the existence of two typhoons on those days.

The typhoon of September 14-19, 1913.—It appears probable that this typhoon went on developing from the 10th to the 13th of the month between 14° and 15° lat. N and 135° and 139° long. E. Nevertheless, as its influence on the stations of Guam and Yap was very insignificant, the Observatory did not possess sufficient data to announce its existence with certainty till the morning of the 15th, when its influence was quite evident on the pressure and wind currents of the Philippines.

The typhoon, as may be seen from the track given in Plate XIII, moved to the W by N during the 14th and 15th, to the WNW on the 16th, and to the NW by W on the 17th, 18th, and 19th. The vortex crossed the Babuyan Islands a few miles from the northern coast of Luzon, during the morning of the 16th. Its passage to the N of Aparri is clearly seen from the observations made in that station and which are given in the following table:

METEOROLOGICAL OBSERVATIONS MADE AT APARRI, CAGAYAN, SEPTEMBER 15 AND 16, 1913.

Date and hour.	Pres- sure.	Wind.		Weath- er.	Rain- fall.	Date and hour.	Pres- sure.	Wind.		Weath- er.	Rain- fall.
		Direc- tion.	Force.					Direc- tion.	Force.		
Sept. 15:	mm.		0-12.		mm.	Sept. 16:	mm.		0-12.		mm.
10 a. m. ....	756.83	N	4	o	7.4	5 a. m. ....	742.54	NW	9	o, q, r	
2 p. m. ....	54.09	NW	5	o, p	1.5	6 a. m. ....	41.44	WNW	9	o, q, r	
6 p. m. ....	53.34	NNW	6	o, r	12.2	7 a. m. ....	41.25	WSW	11	o, q, r	
10 p. m. ....	51.33	NW	6	o, q, r	10.2	8 a. m. ....	42.04	SW	10	o, q, r	
12 midnight ..	49.40	NW	7	o, q, r	(a)	9 a. m. ....	42.53	SW	10	o, q, r	
Sept. 16:						10 a. m. ....	43.58	SW	10	o, q, r	
1 a. m. ....	47.74	NW	7	o, q, r		2 p. m. ....	47.81	S	7	o, q, r	
2 a. m. ....	46.81	WNW	7	o, q, r		6 p. m. ....	50.32	SSE	6	o	3.8
3 a. m. ....	45.15	WNW	8	o, q, r		10 p. m. ....	54.16	S	2	o	1
4 a. m. ....	44.43	NW	8	o, q, r							

\* From 12 midnight Sept. 15 to 2 p. m. Sept. 16, no rain observations could be made, because the gauge was submerged by the river.

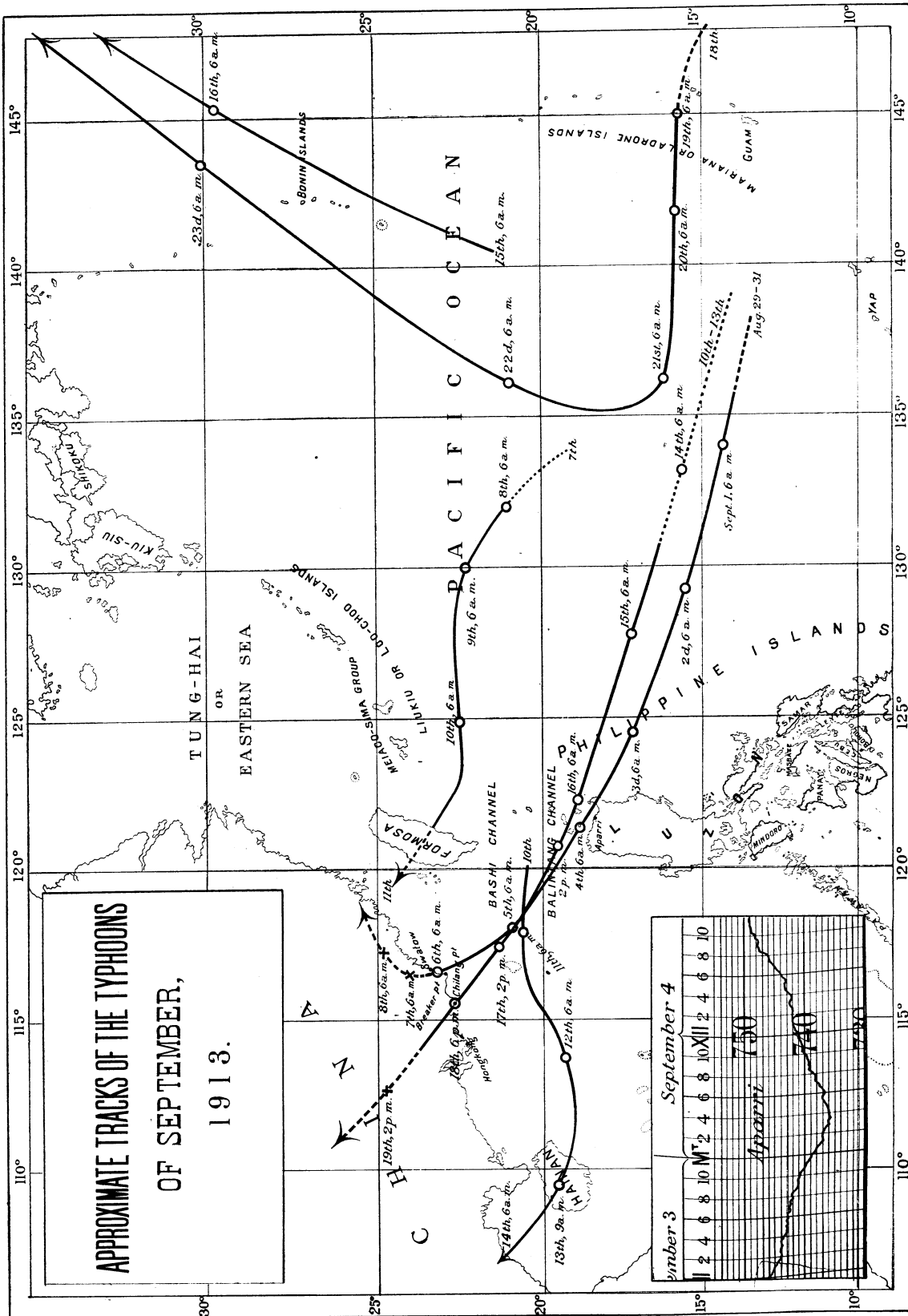
The typhoon entered the continent the evening of the 18th, between Hongkong and Swatow. Below are published the observations made at Chilang Point (22° 40' lat. N and 115° 35' long. E) and which have served admirably for determining the point on the coast where the vortex entered the mainland. The barometer there fell to 724.71 mm. at 6 p. m. of the 18th, with hurricane winds from the NNW which shifted afterwards to SSE. From this it is deduced that the typhoon preserved its intensity even when it penetrated into the continent.

METEOROLOGICAL OBSERVATIONS AT CHILANG POINT,<sup>a</sup> SOUTHERN CHINA COAST, SEPTEMBER 17 TO 19, 1913.

Date and hour.	Pres- sure.	Wind.		Weath- er.	Date and hour.	Pres- sure.	Wind.		Weath- er.
		Direc- tion.	Force.				Direc- tion.	Force.	
Sept. 17:	mm.		0-12.		Sept. 18:	mm.		0-12.	
3 p. m. ....	753.94	W	3	b, c, m	Noon .....	749.62	NNW	7	o, m, p
6 p. m. ....	54.08	ESE	3	b, c, m	3 p. m. ....	42.90	NNW	8-9	o, r, m
9 p. m. ....	54.40	ENE	4	b, c, m	6 p. m. ....	24.71	NNW	12	o, r, m
12 midnight ..	53.89	N	4	b, c, m	9 p. m. ....	41.27	SSE	10	o, r, m
Sept. 18:					12 midnight ..	48.66	SSE	8-9	o, r, m
3 a. m. ....	53.13	N	4	b, c, m	Sept. 19:				
6 a. m. ....	52.40	N	5	b, c, m	3 a. m. ....	51.03	S	8	o, r, m
9 a. m. ....	52.32	N	6	c, m	6 a. m. ....	52.81	S	7	o, r, m

<sup>a</sup> Position: Lat. 22° 40' N; long. 115° 35' E.

Plate XIII.



The Manila Observatory published the following reports of the typhoon in the ordinary weather notes of the 18th and 19th:

September 18, 11 a. m.: The typhoon has inclined to the N since yesterday morning, its center being situated this morning at 6 o'clock, near the China coast between Hongkong and Amoy, moving NNW. It is apparently filling up gradually.

September 19, 11.10 a. m.: The depression over China seems to be moving northwestward at present. Its center was situated at 6 o'clock this morning to the N of Hongkong in about 25° lat. N.

The following warnings were sent to the observatories of the Far East:

September 15, 9.15 a. m.: Typhoon E of northern Luzon, more than 300 miles distant, moving WNW.

September 15, 3.15 p. m.: Typhoon E of northern Luzon, less than 300 miles distant, moving WNW.

September 16, 9.35 a. m.: Typhoon near or over Aparri, moving W or WNW.

September 16, 3.38 p. m.: Typhoon in about 120° long. E and 20° lat. N, moving WNW.

September 17, 8 a. m.: Typhoon in about 118° long. E and 20° lat. N, moving WNW.

The Observatory of Hongkong favored us with these telegrams:

September 15, 10.50 a. m.: Typhoon E of northern Luzon; direction unknown.

September 16, 10.35 a. m.: Typhoon near Balintang Channel, moving WNW.

September 17, 9.30 a. m.: Typhoon NW of Luzon, moving WNW.

September 17, 12.15 p. m.: Typhoon ESE of Hongkong, moving NNW.

September 17, 4.20 p. m.: Typhoon E of Hongkong, moving NNW.

September 18, 10.50 a. m.: Typhoon on mainland, near Swatow, filling up.

September 18, 5.40 p. m.: Typhoon on mainland, near Swatow, moving W.

September 19, 11.40 a. m.: Typhoon NW of Hongkong, moving W.

The Zikawei Observatory transmitted the following warnings to the stations along the China coast:

September 15, noon: Typhoon E of Luzon; direction WNW.

September 16, noon: Typhoon, Balintang Channel; direction WNW.

September 16, 9 p. m.: Typhoon, Pratas, south of Formosa Channel; direction WNW.

September 17, 9 p. m.: Typhoon SE of Hongkong, beyond 120 miles; direction WNW.

September 18, 9 p. m.: Typhoon SE of Hongkong, within 120 miles; direction NW.

September 19, 9 p. m.: Typhoon NW of Hongkong; direction WNW.

The typhoon of September 15-16, 1913.—This typhoon had no influence on the Philippines. According to the daily weather maps of Japan, it formed on the 14th and 15th to the SSW of the Bonin Islands and traveled to the NNE, passing to the E at its least distance from those islands during the night of the 15th. The track is plotted in Plate XIII.

The typhoon of September 19-23, 1913.—According to observations made in Guam, this typhoon was to the N of that station, near 145° long. E and between 15° and 16° lat. N, at 6 a. m. of the 19th. In the beginning it moved to the W till on the 21st it recurved to the NE close to 135° long. E. It passed by the W at its least distance from the Bonin Islands during the night of the 22d.

The following notes were published with reference to this typhoon in the Manila papers:

September 20, 11 a. m.: There appeared yesterday a new typhoon over the Ladrone Islands. Its center was situated at 6 o'clock this morning to the northwest of Guam, moving W.

September 21, 11.50 a. m.: The typhoon was situated at 6 o'clock this morning in the neighborhood of 136° long. E and between 16° and 17° lat. N, moving W or W by N.

September 22, 11.50 a. m.: The typhoon over the Pacific is not dangerous for the Philippines. Its center is situated this morning about halfway between the Ladrone Islands and the Loochoos. It is apparently recurving northeastward.

September 23, 11 a. m.: The typhoon was situated at 6 o'clock this morning to the NNE of the Bonins, moving northeastward.

The following warnings were sent to the observatories of the Far East:

September 19, 7 p. m.: Typhoon near or over the northern Ladrone or Mariana Islands, moving W.

September 21, 9.45 a. m.: Typhoon in about 136° long. E and 16° lat. N, moving W.

September 22, 11.10 a. m.: Typhoon over the Pacific Ocean, about halfway between the Marianas and the Loochoos, recurving northeastward.



## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes es bastante mayor que la del año pasado, aunque se diferencia poco de la normal. Así, la media mensual de Manila se diferencia de la de Septiembre de 1912, en +1.39 mm. al paso que comparada con la normal de este mes nos da una diferencia de solo +0.22 mm. Las mayores presiones se observaron el 23 en Mindanao y en algunas estaciones de Visayas, y el 27 en lo restante de Visayas y en Luzón. Las presiones más bajas ocurrieron el 2 en Visayas y Mindanao, el 3 en el centro y S de Luzón, y el 4 en el N de Luzón.

La temperatura media mensual difiere muy poco de la del año anterior, siendo las diferencias mayores  $-0.7$  y  $-0.8$  °C. correspondientes a las estaciones de Ormoc, Tacloban y Calbayog. Las temperaturas extremas de Manila fueron 33 °C. observada los días 22, 23 y 30, y 21.2 °C. observada el día 29.

**Precipitación acuosa.**—Comparando los totales de lluvia de este mes así con los del año pasado como con los valores normales de Septiembre, resulta que son en general bastante mayores en Manila y en las estaciones al N de Manila, siendo en cambio menores en casi todas las estaciones al S de Manila. En los pluviómetros del Observatorio Central se recogieron en todo el mes 365.5 mm. de agua, cantidad que supera a la de Septiembre de 1912, en 138.1 mm. y a la normal de este mes en 5.7 mm.

## DEPRESIONES Y TIFONES.

Al igual que el pasado mes de Agosto, seis son los tifones que llevamos registrados este mes en el Extremo Oriente. Dos de ellos cruzaron las Filipinas a través de las Islas Babuyanes cerca de la costa norte de Luzón, siendo de notar que ya en Agosto último había pasado otro por esta misma región.

**Tifón de 29 de Agosto a 8 de Septiembre de 1913.**—Parece que se estuvo formando este tifón del 29 al 31 de Agosto al N de Yap, Carolinas Occidentales, entre los paralelos  $13^{\circ}$  y  $14^{\circ}$  N y los meridianos  $138^{\circ}$  y  $139^{\circ}$  E. La trayectoria seguida por este tifón desde el 31 de Agosto hasta la mañana del 4 de Septiembre en que atravesó las Islas Babuyanes fué indicada por el Observatorio de Manila por medio de estas notas y avisos de tifón:

Agosto 31, 5 p. m.: Un nuevo tifón apareció en el mapa del tiempo de esta mañana como formándose al N de Yap, Carolinas Occidentales, en los alrededores de  $14^{\circ}$  latitud N. Parece moverse esta tarde al W o WNW.

Septiembre 1, 11.30 a. m.: El tifón se hallaba a las 6 de esta mañana al E de la parte central de Filipinas en los alrededores de  $14^{\circ}$  latitud N y  $134^{\circ}$  longitud E moviéndose al W o WNW.

Septiembre 2, 11.30 a. m.: El tifón se hallaba a las 6 de esta mañana al E de Luzón en los alrededores de  $15^{\circ}$  latitud N y entre  $129^{\circ}$  y  $130^{\circ}$  longitud E moviéndose al W½NW.

Septiembre 3, 11.30 a. m.: El tifón se hallaba a las 6 de esta mañana al E del norte de Luzón en los alrededores de  $124^{\circ}$  longitud E y entre  $17^{\circ}$  y  $18^{\circ}$  latitud N moviéndose al WNW. Amenaza atravesar o pasar muy cerca de la Provincia de Cagayán esta tarde o noche.

Septiembre 4, 11 a. m.: El tifón se hallaba a las 6 de esta mañana en los alrededores de  $121^{\circ}$  longitud E y entre  $19^{\circ}$  y  $20^{\circ}$  latitud N, moviéndose al NW½W. Pasó la noche pasada muy cerca de la costa norte de la Provincia de Cagayán.

En el texto inglés reunimos en una tabla algunas de las observaciones hechas durante este tifón en las estaciones de Tuguegarao, Aparri, Santo Domingo (Islas Batanes) y Laoag. Desde luego se echa de ver en las observaciones de esta última estación lo abundantes y torrenciales que fueron las lluvias causadas por este tifón en los pueblos de la costa occidental de la parte norte de Luzón. Basta indicar que en el solo intervalo de 14 horas, o sea desde 1 a. m. hasta 3 p. m. del día 4, se recogieron en los pluviómetros de aquella estación 634.8 mm. de agua. El observador hace notar que solamente faltó un palmo para que quedase sumergido el pluviómetro en el agua que inundaba toda la parte baja de la población. También el observador de Vigan habla de la inundación

observada en general en los pueblos cerca de la costa de las provincias de Ilocos Norte e Ilocos Sur y dice haber sido ésta la inundación más grande que ha ocurrido en aquella región desde 1908.

En la Lámina XII publicamos las isobaras de 6 a. m. del 4, 6 a. m. del 5 y 6 a. m. del 6. Según se ve en ellas, el tifón se fué inclinando al N en el Mar de China viniendo a entrar en el Continente por las cercanías de Swatow la mañana del día 6. El observatorio de Manila dijo lo siguiente en las notas ordinarias del tiempo de los días 6 y 7:

Septiembre 6, 11.30 a. m.: El tifón se ha inclinado al N desde ayer mañana al propio tiempo que se ha ido rellenando en parte. Su centro aparecía en el mapa del tiempo de esta mañana muy cerca y al W de Swatow moviéndose al N.

Septiembre 7, 11 a. m.: El tifón en China continúa moviéndose al N en forma de una depresión.

Los siguientes avisos de tifón fueron transmitidos como de costumbre a los Observatorios de Tokio, Zikawei, Taihoku, Hongkong y Phulien:

Agosto 31, 3.40 p. m.: Tifón al NW de Yap, moviéndose al W o WNW.

Septiembre 1, 8.50 a. m.: Tifón al E de la parte sur de Luzón, moviéndose al W o WNW.

Septiembre 2, 9.10 a. m.: Tifón al E de Luzón, distancia mayor de 300 millas, moviéndose al W o WNW.

Septiembre 2, 4.55 p. m.: Tifón en los alrededores de 127° longitud E y 16° latitud N, moviéndose al WNW.

Septiembre 3, 8.50 a. m.: Tifón en los alrededores de 124° longitud E y 17° latitud N, moviéndose al WNW.

Septiembre 3, 10.40 p. m.: Tifón en, o cerca de, Aparri, moviéndose al WNW o NW.

Septiembre 4, 8.30 a. m.: Tifón al NW de Aparri, moviéndose al WNW o NW.

Septiembre 4, 3.45 p. m.: Tifón en los alrededores de 119° longitud E y 20° latitud N, moviéndose al WNW.

Septiembre 5, 9.20 a. m.: Tifón en los alrededores de 118° longitud E y 20° latitud N, casi estacionario.

Septiembre 6, 11.30 a. m.: Tifón en los alrededores de 116° longitud E y 24° latitud N, moviéndose al N.

Del Observatorio de Hongkong se recibieron a la vez estos avisos de tifón:

Septiembre 1, 10.30 a. m.: Tifón al SE de Luzón, moviéndose al W.

Septiembre 2, 10.20 a. m.: Tifón al SE de Luzón, moviéndose al WNW.

Septiembre 3, 9.05 a. m.: Tifón al NE de Manila, moviéndose al NW.

Septiembre 4, 6.35 a. m.: Tifón cerca del Canal de Balintang, moviéndose al NW.

Septiembre 4, 11.40 a. m.: Tifón al W del Canal de Bashee, moviéndose al NW.

Septiembre 5, 10.15 a. m.: Tifón en la parte S del Canal de Formosa, moviéndose al NNW.

Septiembre 6, 6 a. m.: Tifón en el Continente, cerca de Swatow, moviéndose al W.

Septiembre 6, 10.30 a. m.: Tifón al NE de Hongkong deshaciéndose.

El Observatorio de Zikawei siguió la trayectoria de este tifón por medio de los siguientes telegramas transmitidos a las estaciones de la costa de China:

Agosto 30, 4.30 p. m.: Tifón hacia el NW de Yap, distancia menor de 240 millas; dirección desconocida.

Agosto 31, 4.30 p. m.: Tifón hacia el NW de Yap, distancia menor de 240 millas; desarrollándose.

Septiembre 1, mediodía: Tifón lejos al E de Filipinas: dirección WNW. Otro tifón hacia el NW de Yap; estacionario.

Septiembre 2, mediodía: Tifón lejos al E de Luzón: dirección WNW.

Septiembre 3, 10 a. m.: Tifón al E de Luzón: dirección NW.

Septiembre 3, 4.30 p. m.: Tifón al NE de Luzón: dirección NW.

Septiembre 4, 9.50 a. m.: Tifón en el Canal de Balintang: dirección WNW.

Septiembre 4, 9 p. m.: Tifón en Pratas, al S del Canal de Formosa: dirección NW.

Septiembre 5, 4.30 p. m.: Tifón al SE de Hongkong, distancia mayor de 120 millas; dirección NW.

Septiembre 6, 4.30 p. m.: Tifón en la costa al S de 25° latitud: dirección NNW.

**Tifón de 7 a 14 de Septiembre de 1913.**—Dos tifones simultáneos hubo los días 10 y 11 de este mes. El primero había aparecido el 7 en los alrededores de 134° longitud E y 19° latitud N. Parece haberse movido al principio al NW hasta el día 9 en que se dirigió

exactamente al W, viniendo a pasar por el S de Meiacosima la mañana del 10. Por la tarde de este mismo día se inclinó otra vez al NW, atravesó la Isla de Formosa, ya muy disminuído en intensidad, la noche del 10 al 11, y por fin parece que se deshizo el 11 en la parte central del Canal de Formosa.

Mientras este tifón se acercaba a Formosa el día 10, las observaciones de Koshun (sur de Formosa) y Santo Domingo de Basco (Islas Batanes) daban indicios nada equívocos de otro centro ciclónico que aparecía al W del Canal de Balintang en los alrededores de  $120^{\circ}$  longitud E y entre  $20^{\circ}$  y  $21^{\circ}$  latitud N. El hecho de que estas observaciones no fueron recibidas sino mucho más tarde por correo nos hizo suponer a nosotros, lo mismo que a los Observatorios de Zikawei y de Hongkong, que el tifón que el día 11 aparecía claramente en la parte NE del Mar de China era el mismo que había atravesado Formosa la noche anterior, el cual una vez en el Canal de Formosa había de haberse movido en dirección al SW. Sin embargo, todas las observaciones que hemos recibido posteriormente hacen del todo improbable esta suposición. Las isobaras que damos en la Lámina XII señalan claramente la existencia de dos tifones, cuando menos a 10 p. m. del 10, y aún con bastante probabilidad a 2 p. m. de dicho día. El segundo tifón se movió al W hasta la tarde del 11; luego se dirigió al WSW hasta la mañana del 12; emprendió de nuevo su marcha al W durante el día 12, y atravesó la Isla de Hainán y parte norte del Golfo de Tongking el día 13 en dirección al NW.

De Mr. Kondo, director del Observatorio de Taihoku, en Formosa, recibimos observaciones hechas en varias estaciones de aquella isla, durante los días 10 y 11, juntamente con una carta de la cual copiamos las siguientes líneas que coinciden exactamente con lo que llevamos dicho sobre la existencia simultánea de dos tifones en aquellos días.

Mi suposición es que el tifón cruzó la parte central de Formosa, rellenándose en gran parte al atravesar las altas cordilleras de la isla y desapareciendo en cuanto llegó al Continente. Otra depresión desarrollada el 11 al W del Canal de Balintang se movió hacia el S de Hongkong.

**Tifón de 14 a 19 de Septiembre de 1913.**—Parece probable que se estuvo desarrollando este tifón del 10 al 13 de este mes entre los paralelos  $14^{\circ}$  y  $15^{\circ}$  latitud N y los meridianos  $135^{\circ}$  y  $139^{\circ}$  longitud E. Sin embargo, como su influencia en las estaciones de Guam y Yap fué muy insignificante, el Observatorio de Manila no se creyó con datos suficientes para anunciar su existencia hasta la mañana del 15 en que influía ya claramente en los barómetros y corrientes atmosféricas de Filipinas.

Este tifón, como puede verse en su trayectoria (Lámina XIII), se movió al  $W\frac{1}{4}NW$  los días 14 y 15, al WNW el 16, y al  $NW\frac{1}{4}W$  el 17, 18 y 19. El vórtice atravesó las Islas Babuyanes unas pocas millas al N de la costa septentrional de Luzón la mañana del 16. Su paso por el N de Aparri lo muestran claramente las observaciones hechas en aquella estación, las cuales damos en una tabla en el texto inglés.

El tifón penetró en el Continente la tarde del 18 por entre Hongkong y Swatow. En el texto inglés publicamos las observaciones hechas en Chilang Point ( $22^{\circ} 40'$  latitud N y  $115^{\circ} 35'$  longitud E) las cuales nos han servido admirablemente para precisar el punto de la costa por donde penetró el vórtice en el Continente. El barómetro bajó allí a 724.71 mm. a 6 p. m. del 18 con vientos huracanados del NNW que saltaron luego al SSE. Se deduce de esto que el tifón conservaba aún su desarrollo cuando entró en el Continente.

El Observatorio de Manila dijo lo siguiente en las notas ordinarias del tiempo en los días 18 y 19:

Septiembre 18, 11 a. m.: El tifón se ha inclinado al N desde ayer mañana, hallándose su centro a las 6 de esta mañana cerca de la costa de China entre Hongkong y Amoy, moviéndose al NNW. Parece que se está rellenando gradualmente.

Septiembre 19, 11.10 a. m.: La depresión en China parece moverse al presente al NW. Su centro se hallaba a las 6 de esta mañana al N de Hongkong en los alrededores de  $25^{\circ}$  latitud N.

**A los observatorios del Extremo Oriente se transmitieron estos avisos de tifón:**

Septiembre 15, 9.15 a. m.: Tifón al E de la parte norte de Luzón, distancia mayor de 300 millas, moviéndose al WNW.

Septiembre 15, 3.15 p. m.: Tifón al E de la parte norte de Luzón, distancia menor de 300 millas, moviéndose al WNW.

Septiembre 16, 9.35 a. m.: Tifón en, o cerca de, Aparri, moviéndose al W o WNW.

Septiembre 16, 3.38 p. m.: Tifón en los alrededores de 120° longitud E y 20° latitud N, moviéndose al WNW.

Septiembre 17, 8 a. m.: Tifón en los alrededores de 118° longitud E y 20° latitud N, moviéndose al WNW.

**El Observatorio de Hongkong nos favoreció a la vez con estos telegramas:**

Septiembre 15, 10.50 a. m.: Tifón al E del norte de Luzón, dirección desconocida.

Septiembre 16, 10.35 a. m.: Tifón cerca del Canal de Balintang, moviéndose al WNW.

Septiembre 17, 9.30 a. m.: Tifón al NW de Luzón, moviéndose al WNW.

Septiembre 17, 12.15 p. m.: Tifón al ESE de Hongkong, moviéndose al NNW.

Septiembre 17, 4.20 p. m.: Tifón al E de Hongkong, moviéndose al NNW.

Septiembre 18, 10.50 a. m.: Tifón en el Continente, cerca de Swatow, deshaciéndose.

Septiembre 18, 5.40 p. m.: Tifón en el Continente, cerca de Swatow, moviéndose al W.

Septiembre 19, 11.40 a. m.: Tifón al NW de Hongkong, moviéndose al W.

**El Observatorio de Zikawei transmitió los siguientes avisos de tifón a las estaciones de la costa de China:**

Septiembre 15, mediodía: Tifón al E de Luzón: dirección WNW.

Septiembre 16, mediodía: Tifón en el Canal de Balintang: dirección WNW.

Septiembre 16, 9 p. m.: Tifón en Pratas, al S del Canal de Formosa: dirección WNW.

Septiembre 17, 9 p. m.: Tifón al SE de Hongkong, a más de 120 millas: dirección WNW.

Septiembre 18, 9 p. m.: Tifón al SE de Hongkong, a menos de 120 millas: dirección NW.

Septiembre 19, 9 p. m.: Tifón al NW de Hongkong: dirección WNW.

**Tifón de 15 y 16 de Septiembre de 1913.**—Nos contentamos con decir dos palabras sobre este tifón ya que no influyó para nada en Filipinas. Según los mapas diarios de Japón parece que se formó del 14 al 15 al SSW de las Islas Bonín y se dirigió al NNE pasando por el E y a la menor distancia de dichas islas la noche del 15 al 16. Véase esta trayectoria juntamente con las demás de este mes en la Lámina XIII.

**Tifón de 19 a 23 de Septiembre de 1913.**—Según las observaciones hechas en Guam, se hallaba este tifón a 6 a. m. del 19 al N de aquella estación, en los alrededores de 145° longitud E y entre 15° y 16° latitud N. Moviése al principio al W hasta que el día 21 recurvó al NE cerca del meridiano 135° E. Pasó por el W y a la menor distancia de las Islas Bonín la noche del 22 al 23.

El Observatorio de Manila señaló la trayectoria de este tifón por medio de estas notas publicadas en los periódicos de Manila:

Septiembre 20, 11 a. m.: Un nuevo tifón apareció ayer en o cerca de las Islas Ladroneas. Su centro se hallaba a las 6 de esta mañana al NW de Guam, moviéndose al W.

Septiembre 21, 11.50 a. m.: El tifón se hallaba a las 6 de esta mañana en los alrededores del meridiano 136° E y entre los paralelos 16° y 17° N, moviéndose al W o W½NW.

Septiembre 22, 11.50 a. m.: El tifón del Pacífico no es peligroso para Filipinas. Su centro se halla esta mañana a la mitad de camino entre las Islas Ladroneas y Liukiu. Está recurvando aparentemente al NE.

Septiembre 23, 11 a. m.: El tifón se hallaba a las 6 de esta mañana al NNE de las Islas Bonín, moviéndose al NE.

**A los observatorios del Extremo Oriente se transmitieron estos avisos de tifón:**

Septiembre 19, 7 p. m.: Tifón en, o cerca de, la parte norte de las Ladroneas (Islas Marianas), moviéndose al W.

Septiembre 21, 9.45 a. m.: Tifón en los alrededores de 136° longitud E y 16° latitud N, moviéndose al W.

Septiembre 22, 11.10 a. m.: Tifón en el Océano Pacífico, a la mitad de camino entre las Islas Marianas y Liukiu, recurvando al NE.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 38''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Rela- tive humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>			
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.				2.50 meters.		Free expo- sure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.						
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.		
1	755.98	26.1	32.1	22.3	29	30.3	29.9	30	29.3	29	83	20.8	3.1	2.3		
2	53.53	26.6	31	23.3	29.4	30.5	30	30.2	29.3	29	85.9	22.2	2.2	2		
3	50.96	26.1	28.4	24	29.3	29.5	29.8	29.8	29.3	29	87.3	22	1.1	2.7		
4	52.26	26.4	28.9	23.8	28.3	28.5	29.6	29.6	29.3	29	83.2	21.4	2.3	2.6		
5	56.28	27.3	31.5	24.6	28	29	29.2	29.3	29.3	28.9	84	22.6	1.8	2.1		
6	58.20	27.6	32.1	24.3	28.4	29.6	29.2	29.4	29.4	29.1	82.2	22.4	3.4	2.5		
7	58.48	27.4	31.6	23.8	29	29.9	29.5	29.8	29.4	29	84	22.5	4.4	3.1		
8	57.74	28.2	32	26.9	29.5	30.3	29.8	29.8	29.4	29	81.2	23	4.8	3.7		
9	56.39	26.4	29	23.6	29.5	28.5	29.8	29.8	29.3	29	88.8	22.6	.3	1.2		
10	54.78	25.2	27.7	23.7	27.8	27.5	29.1	28.9	29.3	28.6	94.2	22.4	.1	.7		
11	55.44	24.9	30	22.6	26.5	27.5	28.1	28.3	29.3	29	90.1	21	1.5	1.6		
12	58.29	26.6	32.4	22.2	26.9	28.5	28.3	29.6	29.3	29	85.9	22.1	2.8	2		
13	59.63	27.4	32.1	23.2	28.3	29.3	28.8	29	29.3	29	83.8	22.6	3.4	2.4		
14	59.55	27.5	31.1	24.7	29.1	29.6	29.4	29.6	29.3	29	82.3	22.4	4	3.1		
15	57.53	27.7	30.4	26.2	29	29.5	29.7	29.6	29.3	28.9	81.7	22.5	2.8	2.8		
16	57.08	26.8	29.3	25.4	28.5	28.7	29.5	29.2	29.2	28.9	88.2	23	.8	1.4		
17	58.61	27.3	31.5	24.6	28.3	29.4	29.1	29.4	29.3	29	86.9	23.3	2.9	2		
18	59.13	27.6	32.1	23.6	28.5	29.8	29.2	29.8	29.3	29.1	84.9	23.2	3.3	2.3		
19	59.62	27.1	32.1	24.5	29.3	30.5	29.7	29.9	29.3	29	87.1	23	2.7	1.9		
20	59.11	26.2	31.2	23.5	29.3	29.7	29.9	29.8	29.2	29	86.4	21.8	2	1.7		
21	57.76	26.8	32.5	22.4	29	30	29.8	30	29.2	28.9	82.9	21.5	3.1	2.3		
22	58.62	27.3	33	22.8	29.4	30.5	30.1	30.1	29.3	29	82	21.9	4	2.9		
23	59.83	26.4	33	23.5	29.6	30.8	30.1	30.4	29.2	29	87.8	22.3	2.5	1.8		
24	59.62	25.5	30.7	23.2	29.5	29.8	30.3	30.1	29.3	29	91.3	22.1	1.1	1		
25	59.46	25.8	30.7	22.1	28.9	29.6	29.9	30	29.3	29	86.8	21.3	2	1.6		
26	59.24	26.6	32.4	22.8	28.8	29.8	29.8	29.9	29.3	28.9	85.9	22	2.8	2		
27	59.93	26	32.2	23.1	29.2	29.2	29.9	29.8	29.3	29	85.8	21.3	2.5	2.1		
28	59.57	26.6	32.5	22.2	28.9	30.2	29.9	29.9	29.3	29	82.4	21.2	3.6	2.5		
29	59.16	26	32.6	21.2	28.9	30.2	29.9	30.1	29.3	29	84.8	21.1	2.4	2.1		
30	58.46	27.2	33	23	29.2	30.2	30	30.1	29.3	29	82.4	21.9	3.7	2.8		
Mean Total	757.67	26.7	31.3	23.6	28.8	29.5	29.6	29.7	29.3	29	85.4	22.1	2.6	2.2		
Departure from normal	+0.22	-0.2	+0.7	0							-0.2	-0.3		65.2		

Day.	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.	Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.
						Form and its direction.				
						Upper.	Lower.			
1	W quad.	Km. 149	Km. 17	SW	0-10. 5.8	Ci.	Cu.	W	h. m. mm. 9 50 0.8	☾ ☽ ☽ p.
2	SW	277	31	SW	9.1	Ci.-S.	Cu.	WNW	0 30 5.1	● a. p.
3	WSW	574	50	SW	10		Fr.-N.	WNW	0 00 3	☽ a. ☽ d p.
4	WSW	861	48	SW	9.8	Ci.-S.	Cu.-N.	W	0 00 21.4	☽ a. ● a. p.
5	SSW	505	38	WSW	9.5	Ci.-S.	Cu.-N.	SW	2 10 6.4	● a. p. ☽ p.
6	SW	327.5	29	SW	5.7	Ci.	Cu.	W	8 05 .3	☽ a.
7	WSW	271	26	WSW	6.7	A.-Cu. WbyN	Cu.	W	5 05	
8	WSW	530	38	WSW	8.5	A.-Cu. ENE	Cu.	W	2 55	
9	sw, wsw	671	46	SW	10	A.-Cu.	Cu.-N.	W	0 00 105.8	☽ a. p. ● p.
10	S, SW	502	39	SW	10		N.	WSW	0 00 128.2	● a. p. ● p.
11	SW quad.	323	31	SSW	9.4	Ci.-S.	Cu.	WSW	0 55 44.9	● a. p. ☽ p.
12	sw, wsw	209	23	WSW	7.4	Ci., A.-Cu. ENE	Cu.	W	6 50 6.5	● p.
13	SW	208	24	SW	2.3	Ci.-S.	Cu.		9 35 .6	● p.
14	wnw, wsw	174.5	13	WNW	8.8	Ci.-S., A.-Cu. NE	Cu.		0 35	
15	wnw, wsw	460.5	35	WSW	10	Ci.-S.	Cu.		0 00	☽ p.
16	SW	574	39	SW	10		Cu.-N.	WSW	0 00 16.2	● a. p.
17	S quad.	322	29	SW	8.5	Ci.	Cu.	SW	4 00	☽ a.
18	WSW	227.5	26	WSW	6.8	Ci.	Cu.		6 45 2	☽ p.
19	Variable	96	14	WNW	9.5	Ci.-S., Ci. ENE	Cu.		3 15 .3	☽ a. ☽ p.
20	NW quad.	129	16	ENE	7.3	Ci.	Cu.	NE	5 20 4.8	☽ p.
21	W quad.	117.5	16	WbyS	4	Ci.	Cu.	E	10 05 .8	● p.
22	SW quad.	159	16	SSW	4.9	Ci.	Cu.	NE	9 25	☽ p.
23	SW quad.	115.5	16	WSW	5.7	Ci.	Cu.	E, SE	6 15	☽ d ☽ p.
24	Variable	85.5	15.5	W	7.2	Ci.	Cu.	NE by E	3 05 5.1	☽ a. ☽ p.
25	Variable	105.5	12	WNW	8.4	Ci., Ci.-S.	Cu.	E	1 15	
26	NW quad.	142.5	17	WNW	8.6	Ci.-S.	Cu.	E	3 10	☽ p.
27	NW quad.	157.5	18	NW, NNE	6.6	Ci.-S.	Cu.	E	6 05 1.3	☽ a. ☽ p.
28	W quad.	136	12	WSW, W	3.2	A.-Cu.,	Cu.	EbyS	10 05	☽ a.
29	W	113	15	W	5	Ci.-Cu. EbyS	Cu.		7 55 5.1	☽ a. p.
30	W quad.	141.5	16	NE	2.8	Ci.	Cu.		10 45 6.9	☽ p.
Mean Total		288.8	25.5		7.4				4 28	
Departure from normal		8,664.5			-0.3				133 55 365.5	
		+422.5							-2 52 +5.7	

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.

METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.<sup>a</sup>

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	mm.	°C.	°C.	°C.	P. ct.			mm.	Prevailing direction.		Force (mean).	Form and its direction.			
												Upper.			Lower.
1.	755.54	26.1	30.2	22.8	87.5	21.8	W, SW	0-12. 0.8	0-10. 9.3	Ci.-S.	Cu. NW	mm. 23.9	● <sup>2</sup> p.		
2.	54.86	25.7	28	24.3	89.2	21.8	SW	3.5	10	Ci.-S.	Fr.-N. W quad.		d° a.		
3.	55.48	25.8	29.5	22.8	88.2	21.8	S, SSW	3.2	10	Ci.-S.	Cu. SSW, SW	10.2	● <sup>2</sup> p.		
4.	56.84	27	30.3	24	81.3	21.5	S	3.3	6.3	Ci.-S.	Cu. SSW, SW				
5.	58.56	27.7	32	24.1	79.3	21.6	S	1.5	2.8	Ci.	Cu. SW				
6.	58.75	26.7	31.5	22.6	86.2	22.2	S	1	2.3	Ci.	Cu. SSW				
7.	58.80	26.8	32.2	23.6	87.7	22.6	S	1.5	6.5	Ci., Ci.-S.	Cu. SSW		d° p.		
8.	58.32	26.6	32.3	23.4	88	22.6	S	.8	6	A.-Cu.	Cu. SW	4.3	● d° p.		
9.	57.85	27.4	31.2	24.7	86.3	23.2	SW	.8	6.7	Ci.-S.	Cu. W		● a. 2 p.		
10.	56.91	27.7	31.8	25.2	79.8	21.9	S	1.3	7.3	Ci.-S.	Cu. SSW				
11.	57.59	27.7	31.7	24.3	84.3	23	SSW	1.2	4.8	Ci.-S.	Cu. SSW		2 p.		
12.	58.86	27.7	31.9	22.6	84	22	S quad.	1.3	5	Ci.-S.	Fr.-Cu. SW		2 p.		
13.	59.20	26.9	32	23.1	88	23	Variable	1	6	Ci.-S., Ci.	Cu. NW, W		2 p.		
14.	59.29	25.5	29.8	21.5	89.8	21.8	S quad.	1.7	9.2	Ci.-S.	Fr.-N. NW	9.4	d° a. ● 2 2 p.		
15.	58.59	26.1	30.2	22	86.8	21.7	S, SW	1.7	6.8	Ci.-S.	Cu. SW				
16.	58.36	27.4	30.6	25	84.7	23	S	1.3	6.3	Ci.-S.	Cu. WSW, SW		2 p.		
17.	59.05	27	31.3	23.5	84.7	22.3	S, SSW	.7	5.3	Ci.	Cu. SW, W				
18.	59.08	25.9	29.9	22.6	91.2	22.5	SW	.2	7	Ci.-S.	Cu. S				
19.	59.40	25.8	30	22.1	87.2	21.4	SSE	.8	6.7	Ci.-S., Ci.	Cu. S				
20.	58.65	25	30.3	22.5	92.2	21.6	NW	.3	9	Ci.-S.	Cu. S	54.9	2 2 ● d° p.		
21.	58.25	25.4	28.9	21.7	89.2	21.4	SW	.7	9.2	Ci.-S.	Cu. S				
22.	59.08	26.7	30.7	24.1	83	21.6	W, SW	1.5	5.5	Ci.-S., Ci.	Cu. W		d° p.		
23.	59.56	26.4	30	23.8	88.3	22.4	W quad.	.8	7.7	Ci.-S.	Cu. W		2 d° p.		
24.	59.05	26	30.4	23.2	89.8	22.3	SSW	.7	6.8	Ci.-S.	Cu. SW	5.1	● a. d2 p.		
25.	58.70	26.1	30.9	22.3	89	22.3	S	.7	5.7	Ci.-S., Ci.	Cu. S	.5	p° 2 p.		
26.	58.80	26.1	30.7	22.7	90	22.5	Variable	.8	4.3	Ci.-S., Ci.	Cu. SSE		2 p.		
27.	59.27	26.2	30	22.6	89.5	22.6	S, SSW	.7	4.2	Ci.	Cu. S				
28.	59	26.8	31.3	23.5	86.5	22.3	SSW	.2	4	Ci.	Cu. S	10.7			
29.	58.77	26	30.7	22.9	86.5	21.5	SW	.8	7.7	Ci.-S.	Fr.-N., Cu. SW		● 2 2 a.		
30.	58.31	26.2	31.8	22.6	85.3	21.4	SSW, S	.7	3.2	Ci.	Cu. SW				
Mean	758.29	26.5	30.7	23.2	86.8	22.1		1.2	6.4						
Total												119			

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	754.60	26.4	27.7	24.4	82.3	21.1	W	419.5	9	Ci.-S.	Fr.-N., Cu.-N. w	13.7	● <sup>2</sup> p.
2.	53.60	27	28.3	25.9	75	19.8	SW	765.6	10	Ci.-S.	Fr.-N. WSW	10.9	✓ <sup>o</sup> p.
3.	55.19	27.8	32.6	23.7	73.7	20.1	SW	341.9	9	Ci.-S.	S.-Cu. SW		● a. ○ <sup>2</sup> p.
4.	56.83	28.4	35.5	24.9	69.5	19.4	ws, ssw	253.7	4.5	Ci.	Cu. SW		
5.	58.43	27.5	34.8	23.4	77.5	20.7	Variable	154.3	1.7	Ci.	Cu.		
6.	58.76	27.5	32.8	23.3	82.2	22.4	NW, ENE	102.5	2.8	Ci., A.-Cu.	Cu.-N.		
7.	58.56	28.3	34.1	24.3	74.7	21.1	W quad.	167	6.2	Ci.	Cu.-N.		↑ <sup>2</sup> < <sup>2</sup> p.
8.	58.09	28.1	34.1	23.9	75.7	21	WSW	214.5	5.3	Ci.	Cu.-N.		
9.	57.38	29.3	33.3	27.1	68.5	20.5	WSW	332.5	7.2	Ci.	Cu.-N.		○ <sup>o</sup> a. ○ p.
10.	56.77	29	33.8	27.3	69.3	20.6	WSW	341.5	8.3	Ci.-S.	Cu.-N.		
11.	57.35	28.2	34.3	24.6	75	21	W quad.	158	6.3	A.-Cu.	Cu.-N. W		d <sup>o</sup> a.
12.	58.84	27.9	33.8	23.7	79.2	21.8	W, NW	148.9	3.2	Ci.	Cu.-N.		
13.	59.11	27.8	33.1	23.9	82.3	22.8	NW	126	5.2	A.-Cu.	Cu.-N.		
14.	59.20	27.5	34	23.7	79.8	21.7	SW quad.	192.7	5.7	Ci.	Cu.-N.	2.5	○ <sup>o</sup> a. p.
15.	58.49	27.8	32.8	24.1	77.2	21	SW quad.	183.7	5.7	Ci., Ci.-S.	Cu.-N. SW		● <sup>o</sup> a. < p.
16.	58.44	27.6	33.8	24.1	73.8	19.9	WNW	173.2	4.7	Ci.	Cu.-N.		< p.
17.	59	27.7	33.2	23.7	77.5	21.1	W	177.2	5.5	Ci.	Cu.-N. SW	.8	
18.	58.99	27.4	33	23.9	81.7	21.8	Variable	141.5	6.7	Ci.-S.	Cu.-N. SW	37.6	d a.
19.	59.15	26.6	31.3	22.8	81.2	20.9	W quad.	139.8	9	A.-Cu.	Cu.-N. SSW	14	● a.
20.	58.38	25.5	27.8	23.5	90.8	22	WNW	110.8	9.8	Ci.-S.	Cu.-N.	27.7	↑ <sup>2</sup> <sup>o</sup> a. ● a. p.
21.	57.97	26	29.8	23.1	85.7	21.3	W, WSW	189.5	9	Ci.-S.	Cu.-N.	3.6	● <sup>o</sup> a.
22.	58.93	27.3	30.5	23.8	75	20	SW quad.	202.5	8.5	A.-Cu.	Cu.-N. W	12.8	● < ↑ <sup>2</sup> <sup>o</sup> p.
23.	59.52	26.4	31.2	22.9	83.8	21.2	W	146.5	8	Ci.-S.	Cu.-N. SW		● a.
24.	59	26.8	31.7	23.1	82.2	21.2	Variable	106.7	5	Ci.	Cu.-N. SW	2	
25.	58.67	26.9	31.4	23.4	85.5	22.4	NE	146	6	Ci.	Cu.-N. NE		● <sup>o</sup> a.
26.	58.84	27	31.9	23.9	85.2	22.5	ENE	209.5	3.8	Ci.	Cu.-N. E	.5	d p.
27.	59.39	27	32	23.1	83.7	22	SW	130.8	3.2	Ci.	Cu.-N. ENE		
28.	58.75	27.2	31.4	23.7	87.7	23.5	Variable	171.4	4	Ci.	Cu.-N.	2	
29.	58.44	26.8	31.8	24.3	84.7	22.2	WSW	6	6	A.-Cu.	Cu.-N. W		d a.
30.	58.10	26.9	32.6	23.3	83.3	21.8	W	3.8	3.8	Ci.	Cu., Cu.-N. W		
Mean	758.09	27.4	32.3	24	79.5	21.3		212.4	6.1				
Total												128.1	

<sup>a</sup> All the mean values given in these tables are deduced from six daily observations.

## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied, -1.84 mm.]

Day.	Pressure (mean).	Temperature.			Relative humid-ity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours be-ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total move-ment in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	755.19	27.1	30	25	73.2	19.4	SW quad.	385.9	7.5	Ci.-S.	Cu.-N. WNW	2.3	☉ a. ☉ p.
2.	53.94	26.6	28	24.8	78.8	20.4	SW	905.7	8.5	Ci.-S.	Cu.-N. SW	.8	☉ a. ☉ p.
3.	54.96	27	29	23.4	74.2	19.6	SW	1,262.6	7.8	Ci.-S.	Cu.-N. SW	3	☉ a. ☉ p.
4.	56.54	28	29.8	24.5	73.5	20.6	SW	1,010.1	5.2	Ci.	Cu. SW	.5	☉ a. ☉ p.
5.	58.41	28.2	30.2	26	76.3	21.6	SW	548.9	2.8	Ci.	Cu. SW		☉ a. ☉ p.
6.	58.79	28.1	31	24.4	72.2	20.3	SW	198.6	2.7	Ci.	Cu. W		☉ a. ☉ p.
7.	58.59	28.1	31.8	25.4	74	20.9	SW quad.	250.7	4.3	Variable	Cu. W	1.5	☉ a. ☉ p.
8.	58.26	28.1	30.2	26.3	73.2	20.7	SW	487	4	Ci., Ci.-S.	Cu. W		☉ a. ☉ p.
9.	57.52	28.4	30	26.7	73.2	21	SW	585.9	5.5	Ci.-S.	Cu. SW		☉ a. ☉ p.
10.	56.63	28.1	30	26.8	72.7	20.6	SW	556.1	7	Ci.-S.	Cu. SW		☉ a. ☉ p.
11.	57.37	28	30	25.6	77.7	21.8	SW	533.2	5	Ci.-S.	Cu. SW	.5	☉ a. ☉ p.
12.	58.82	28.2	31.2	25.2	73.2	20.7	SW	326.5	3	Ci.	Cu. W		☉ a. ☉ p.
13.	59.16	27.9	31.8	24.6	77.8	21.5	Variable	183.7	3.5	Ci.-S.	Cu. N	1.5	☉ a. ☉ p.
14.	59.28	27	30.3	24.3	82	21.6	S quad.	296.8	5.8	Ci.	Cu.-N. NE	3.8	☉ a. ☉ p.
15.	58.49	27.3	30.5	23.8	79.2	21.2	SW	367	5.8	Ci.-S.	Cu. WSW		☉ a. ☉ p.
16.	58.37	28.2	30.5	26.4	73.3	20.9	SW	442.6	3.7	Ci.	Cu. SW		☉ a. ☉ p.
17.	59.21	27.9	31.1	25.5	73.7	20.6	SW quad.	241	4	Ci., Ci.-S.	Cu. SW		☉ a. ☉ p.
18.	59.07	27.3	31.4	24.9	74.8	20.1	S	155.8	5.2	Ci.-S.	Cu. NE quad.	.5	☉ a. ☉ p.
19.	59.28	27.3	30	24.7	77.3	20.9	S	211.3	6.7	Ci., Ci.-S.	Cu., Cu.-N. NNE	1	☉ a. ☉ p.
20.	58.45	27.6	30.5	25	77	21	SE, SW	169.6	7.2	Ci.-S.	Cu.-N. NNE	.5	☉ a. ☉ p.
21.	58.12	26.8	29.4	24.5	80.7	21	S quad.	315.7	6.5	Ci.-S.	Cu.-N. N	12.2	☉ a. ☉ p.
22.	58.89	26.5	30.1	24	80.3	20.6	SW	397.4	6.5	Ci.	Cu.-N. SW	6.8	☉ a. ☉ p.
23.	59.56	26.8	30	24.2	79.5	20.8	Variable	218.4	4.7	Variable	Cu. SW	2.5	☉ a. ☉ p.
24.	59.04	27.7	31.5	24.5	75.8	20.7	SW quad.	179.7	3.8	Ci., Ci.-S.	Cu. N, NNE		☉ a. ☉ p.
25.	58.81	27.9	31.9	24.2	72.2	19.9	NE quad.	198.8	3.3	Ci.	Cu. NE		☉ a. ☉ p.
26.	58.71	28.2	32	25	70.5	20	N quad.	253.4	3.3	Ci.	Cu. ENE	4.8	☉ a. ☉ p.
27.	59.21	28	31.8	24.5	74	20.6	N quad.	199.4	2.8	Ci.	Cu. NE		☉ a. ☉ p.
28.	58.74	28.8	32.9	25.5	72.8	21.2	Variable	209.1	4.5	Ci.	Cu., Cu.-N. ENE	3.8	☉ a. ☉ p.
29.	58.76	26.5	29	24.7	81.3	20.8	SW	309.2	7.2	Ci.-S.	Cu.-N. ENE, W	1.3	☉ a. ☉ p.
30.	58.31	27.2	30.8	24.3	77	20.6	SW quad.	214.3	3.2	Ci.	Cu. NE		☉ a. ☉ p.
Mean	758.15	27.6	30.6	25	75.7	20.7		387	5				
Total								11,609.4				47.3	

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied, -1.84 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.		
1.	755.66	25.7	28.1	23.3	83.8	20.5	SW, W	208	9.3	Ci.-S.	Cu.-N.		☉ a. d p.	
2.	54.12	25.6	27.4	24	86.5	21	SW	515.9	10	Ci.-S., A.-Cu. w	Cu.-N.	20.5	☉ a. p. ☉ p.	
3.	54.57	24.9	27.1	22	89.8	21	SW	812.2	10		N.	50.3	☉ a. p.	
4.	55.76	26.5	28	22	83.8	21.4	SW	625.6	10	Ci.-S.	N.	75.3	☉ a. p.	
5.	58	26.7	29.5	21.6	84.7	21.9	SW	331.1	6.2	Ci., Ci.-S.	Cu.-N.	40.4	☉ a. p.	
6.	58.72	27.2	29.8	23.4	81	21.6	SW	221.7	3.3	Ci.	Cu.		☉ a.	
7.	58.53	27.2	30.2	23.9	81.7	21.7	SW quad.	246.8	4	Ci.	Cu.		☉ p.	
8.	58.21	27.3	30.4	23.5	81.8	21.9	SW	323.4	4.8	Ci.	Cu.		☉ p.	
9.	57.49	27.8	29.4	24.4	80.8	22.5	SW	432.5	7.8	Ci.-S.	Cu.	SW	☉ a. ☉ p.	
10.	56.50	27.2	29.5	24.2	82.2	21.9	SW	408.6	9.5	Ci.-S.	Cu.	3		
11.	56.94	27.1	29	24.4	83.5	22.2	SW	316.3	9.3	Ci.-S.	Cu.-N.	SW	9.7	☉ a. ☉ a. p. ☉ p.
12.	58.77	26.7	30.5	24.5	81.5	21.1	S, SW	180.9	7.7	Ci., Ci.-S.	Cu.	2.3	☉ d ☉ p.	
13.	59.07	27.2	31.8	23.8	82.3	22	Variable	125	5.2	Ci.	Cu.		☉ a.	
14.	59.10	27	32.5	24.4	79.8	20.7	SW	151.2	6.7	Ci.	Cu.	3.8	☉ a. ☉ a. ☉ p.	
15.	58.10	27.6	30.7	24	80.7	21.9	SW	295.2	8.3	Ci.-S.	Cu.		☉ a. ☉ a. p.	
16.	58.22	27.3	29.6	25.1	85.7	23.1	SW	361	8.7	Ci.-S.	Cu.-N.	16.8	☉ d a. ☉ p	
17.	59	27.6	30.6	25.7	79.8	21.8	SW	286.9	7.8	Ci.-S.	Cu.	SW	☉ p.	
18.	58.99	26.8	30	23.8	82.5	21.6	S	135.9	8.3	Ci.-S.	Cu.		☉ a. ☉ d p.	
19.	59.28	26.3	31.2	23.7	83.8	21.1	NW, NE	128.4	8.5	Ci.-S.	Cu.	NNE	10.4	☉ a. ☉ d ☉ p.
20.	58.59	26.2	28.5	23.9	84.7	21.4	NE	159.6	9.3	Ci.-S.	Cu.		☉ a. d p.	
21.	57.90	26.3	32	23	82.2	20.7	NE, S	164	8.5	Ci.-S.	Cu.-N., Cu.	55.4	☉ a. p.	
22.	58.92	25.8	29.3	23	85.5	21.1	SW	187.9	8.5	Ci.	Cu.-N.	SW	1	☉ d p.
23.	59.68	26.5	29.4	24.4	83	21.3	SW, W	172	6.2	Ci., Ci.-S.	Cu.		☉ p.	
24.	59.10	26.3	31.1	23	81.3	20.6	W	117.2	5.2	Ci., Ci.-S.	Cu.	19.5	☉ a. ☉ ☉ a. ☉ p.	
25.	58.52	27.2	31.8	23.9	81.3	21.4	NE	167.8	6	Ci.	Cu.	19.6	☉ ☉ a. ☉ p.	
26.	58.62	27.7	31.9	24.8	79	21.6	N quad.	172.9	5.3	Ci., Ci.-S.	Cu.		☉ ☉ p.	
27.	59.14	27.6	32	24.3	78.7	21.3	NE	228.8	3.5	Ci.	Cu.	3.3	☉ p.	
28.	58.68	27.9	32	24.1	77.8	21.4	NE	282.9	4.7	Ci., Ci.-S.	Cu.	2	☉ a. ☉ a. p.	
29.	58.88	25.6	27.4	24.1	87.8	21.4	N, SW	178.6	7.2	Ci.-S.	Cu.-N.	7.1	☉ a. ☉ a. p. ☉ p.	
30.	58.22	26.4	30.9	23.4	82.8	21	NW, SW	114.1	4.3	Ci., Ci.-S.	Cu.		☉ a. ☉ a. p.	
Mean	758.04	26.8	30.1	23.8	82.7	21.5		268.4	7.1					
Total								8,052.4				340.4		

*Meteorological data for first and second class stations—Continued.*

**ORMOC.**

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied,  $-1.83$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	755.34	24.7	26.8	22.9	95.8	22.2	NW quad.	107.2	10	Ci.-S.	N.	WNW	135.9	☐ a. d. ● a. p.
2.	53.80	26.7	28.7	23.1	85	22	SW, SSW	368.1	10	Ci.-S.	Cu.-N.	W	2	● a. d a. p.
3.	55.05	27.8	29.4	24.9	78.5	21.7	S quad.	854.7	10	Ci.-S.	Cu.-N.	SW	1.6	d ☐ a. p.
4.	56.75	28	29.4	26.1	77.3	21.7	S, SSE	576.5	7.8	A.-Cu.	WSW	Cu.-N.	SW	☐ a. p.
5.	58.55	28.2	30.5	24.8	79	22.4	SE	284.1	4.8	A.-Cu.	W	Cu.-N.	WSW	☐ a. p.
6.	59.06	27	31.6	23.4	83.2	21.8	SE	133.6	4.8	A.-Cu.	NW	Cu.-N.	WNW, WSW	☐ a. p.
7.	58.83	26.7	31.2	22.9	87	22.6	S	95.2	6.5	Ci.	ENE	Cu.-N.	W	☐ a. p.   p d < p.
8.	58.35	26.8	30.3	23.8	88.5	23	SE		6.7	A.-Cu.	ENE	Cu.-N.	W	☐ a. p.   p d < p.
9.	57.60	27	31	23.3	84.3	22.2	Variable	209.7	9.3	Ci.-S.		Cu.-N.	W	☐ a. p.   p d < p.
10.	56.67	28.4	30.8	24.3	79	22.5	S quad.	335.7	9.2	Ci.-S.	NNW	Cu.-N.	WSW	☐ a. p.
11.	57.53	28.6	31	24.9	77.8	22.6	SE	291.6	7.3	Ci.	NNE	Cu.-N.	SSW, W	☐ a. p.
12.	59	27	31.8	23.3	83.5	21.8	SE quad.	114.6	6.2	A.-Cu.	N	Cu.-N.	WNW	☐ a. p.   p d < p.
13.	59.34	26.5	32.8	22.2	85	21.6	N, NE	108.8	5.2	Ci.	NE, ESE	Cu.-N.	NNW, NW	☐ a. p.   p d < p.
14.	59.32	27	30.6	24.5	84.8	22.3	Variable	103.9	8.7	Ci.	ENE	Cu.-N.	WNW	☐ a. p.   p d < p.
15.	58.66	27.1	30.7	23.8	82.3	21.8	SE	165.6	8	Ci.-S.	E	Cu.	W	☐ a. p.   p d < p.
16.	58.50	28.1	30.7	25.2	77.5	21.6	SE	249.8	7.7	Ci.-S.	ENE	Cu.-N.	SW, WSW	☐ a. p.   p d < p.
17.	59.22	27.4	31.5	24.3	84.5	22.7	Variable	137.7	7.2	Ci.-S.		Cu.-N.		☐ a. p.   p d < p.
18.	59.21	25.8	31.2	23.1	90	22	N	110.5	8.2	Ci.-S.	E	Cu.-N.	NE	☐ a. p.   p d < p.
19.	59.32	26	31.2	23.9	89.7	22.3	SE quad.	122.1	8.7	Ci.-S.		Cu.-N.	ESE, NE	☐ a. p.   p d < p.
20.	58.75	25.1	29.6	23.3	94.8	22.4	NE	73.8	9.2	Ci.-S.		Cu.-N.	NNW, WNW	☐ a. p.   p d < p.
21.	58.34	25.2	28.9	22.1	92	21.9	NE quad.	124.8	9	A.-Cu.	E	Cu.-N.	S	☐ a. p.   p d < p.
22.	59.37	25.7	30.3	22.4	85.5	20.8	E quad.	158.9	8.2	Ci.-S.	E	Cu.-N.	W	☐ a. p.   p d < p.
23.	59.89	25.9	29.8	22.5	86.2	21.4	E quad.	96.9	7.3	Ci.-S.	E	Cu.-N.	S	☐ a. p.   p d < p.
24.	59.41	24.7	30.7	21.6	91.8	21.2	NE	108.5	6.5	Ci.-S.		Cu.-N.	NE	☐ a. p.   p d < p.
25.	58.86	26	31.5	21.7	83.5	20.7	N, NW	111.5	5.8	Ci.	E	Cu.-N.	E, ENE	☐ a. p.
26.	58.91	26.5	32.1	21.3	80.3	20.5	Variable	131.6	4.2	Ci.		Cu.-N.	NE	☐ a. p.   p d < p.
27.	59.51	26.2	31.8	22.4	84.2	21	NW	119.1	4.5	Ci.-S., Ci.		Cu.	ENE, NNE	☐ a. p.   p d < p.
28.	58.84	26.2	32	22.5	84.3	21	Variable	130.1	6	A.-Cu.	NNE	Cu.-N.	NE	☐ a. p.   p d < p.
29.	58.84	25.4	29.8	22	88.7	21.4	N	126.9	6.7	Ci.-S.		Cu.-N.	WNW	☐ a. p.   p d < p.
30.	58.41	26.2	30.6	22.4	88	22	S	119.2	5.2	Ci.-S.	E	Cu.-N.	E, N	☐ a. p.   p d < p.
Mean	758.31	26.6	30.6	23.3	85.1	21.8		195.5	7.3					
Total													482.9	

**TACLOBAN.**

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	mm.	°C.	°C.	°C.	P. ct.			mm.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
												Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.									
1.	751.48	26.2	29	23.8	86.3	21.7	WNW	2	8.7	Ci.		Cu.-N. NW, WNW	7.1	☁ a. d. ☉ p.	
2.	52.81	26.4	28.4	23.8	79.8	20.4	W, SSW	2.5	9.3			Cu.-N. W	1	☉ a. ● a. p.	
3.	54.26	26.9	31.3	24	73.8	19.4	SSW	2.2	8.3	Ci.		Cu.-N. SW	1.3	d ● p.	
4.	56.15	27.9	33.3	24	68.3	19	S	2.2	7.7	Ci.	ESE	Cu.-N. SW			
5.	57.96	28.3	34	24	74.3	21	S	1	5.3	Ci., Ci.-S.		Cu. SW			
6.	58.67	27.7	32.8	24.4	82.3	22.4	SW	.7	5.3	A.-Cu. SW		Cu.-N. SW			
7.	58.31	27.8	32	24.6	82.8	22.6	E, W	.5	6.3	Ci.	E	Cu. SW		☉ p.	
8.	57.86	28	33	24.4	76.8	21.4	W quad.	1.3	7.3	Ci.	E	Cu. SW		☉ a. p. ☉ ☉ p.	
9.	57.01	27.2	31.5	24	83.5	22.2	ESE	.3	7.5	Ci.	ENE	Cu. W		☉ ☉ a. p. ☉ ☉ p.	
10.	56.09	28.4	34.5	24.3	74.7	21.1	SSW	.8	7.2	Ci.	N	S.-Cu. WSW		☉ a.	
11.	56.74	28.5	35	24.6	76.3	21.8	S, ESE	1.3	5.8	Ci.-S.	NNE	Cu.-N. SW		☉ ☉ a. p.	
12.	58.65	27.7	33	24.9	82.3	22.4	Variable	.7	7	Ci.		Cu., Cu.-N. WNW, NW		☉ p.	
13.	59.05	27.9	33	23.8	79	21.5	WNW	1	5.3	Ci.	NE	Cu. NW		☉ ☉ a. d. p.	
14.	58.83	27.3	32	23	80.2	21.4	WNW	.5	6.7	Ci.	SE	Cu. NW		☉ a. p. ☉ p.	
15.	58.08	27.4	32.2	23.4	81.3	21.9	ESE	.7	6.7	Ci.	E	Cu. W	2	☉ ☉ a. ☉ a. p. ☉ p.	
16.	58.10	27.6	32	23.8	81.2	22	ESE	.7	6.8	Ci.	E	Cu. WSW		☉ ☉ a. p.	
17.	58.94	27.8	33	24.5	83.3	22.9	WNW	1.3	7.3	Ci.	E	Cu.-N. NW	.3	☉ ☉ a. ☉ ☉ p. ☉ p.	
18.	58.98	27	32	24.3	85.7	22.5	WNW	.5	7.8	Ci.	ESE	Cu.-N. NE	15.5	☉ ☉ ☉ a. ● ☉ p.	
19.	58.96	26.9	32.2	24	84	21.8	NW quad.	1	8.2	Ci.	WNW	Cu.-N. NE	6.9	☉ ☉ p.	
20.	58.26	25.4	30.4	23.3	90	21.6	NW	.5	7.5	Ci.		Cu.-N. NE	17.2	☉ a. p. ☉ p.	
21.	57.85	26	32.7	23.8	89.2	22.1	NW quad.	.7	6.7	Ci.-S.		Cu.-N. NE	1	d ● p.	
22.	58.80	26.5	31.5	23.1	85.8	21.9	WNW, ESE	.7	6.8	Ci.-S.		Cu. W	31.5	☉ a. ☉ p.	
23.	59.36	26.4	31.3	23.1	81.3	20.5	WNW, NW	1	7	Ci.-S.	S	Cu. N	2.8	☉ a. p.	
24.	59.17	25.8	31.4	23	86.5	21.2	Variable	.3	4.8	Ci.	S	Cu.-N. N	2.5	☉ ☉ d. a. p.	
25.	58.76	27.3	32	23.2	82.7	22.1	SE	1.3	5.2	Ci., Ci.-S. SSE, S		Cu. ENE, SE		☉ ☉ a.	
26.	58.77	27.5	33	24.2	84.2	22.8	SE	.7	2.8			Cu. SE		☉ a. ☉ p.	
27.	59.66	26.9	32.6	24.2	85	22.2	NW	.8	3.2	Ci.-S.	NW	Cu. SE	3	☉ ☉ a. ☉ p.	
28.	58.95	26.9	32.4	24	86.2	22.3	NW	1	7	Ci.-S.	NW	Cu. E	22.1	☉ a. ● ☉ ☉ p.	
29.	58.46	26.4	31.6	24.7	87.5	22.5	WNW	1.2	7.2	Ci.-S.	W	Cu.-N. NNE	2	☉ a. p. ☉ p.	
30.	57.90	27	32.8	23	81.7	21.4	WNW, SE	1.2	5.3	Ci.-S.	S	Cu., Cu.-N. NE	6.4	☉ p.	
Mean	757.87	27.2	32.2	23.9	81.9	21.7		1	6.6						
Total													122.6		



## Meteorological data for first and second class stations—Continued.

## CAPIZ.

[ $\phi=11^{\circ} 35' N$ ;  $\lambda=122^{\circ} 45' E$ ; barometer above sea, 6.6 meters; gravity correction not applied, -1.81 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	755.58	27.3	32.4	23.6	80.7	21.5	WNW	188.7	8.3	Ci.-S.	Fr.-N., Cu.SW, NW	mm.
2.	53.66	26.6	30.4	24.4	82	21.2	W	139.3	10	Ci.-S.	Fr.-N. W	4.1
3.	53.34	25.4	29.9	23.5	85.7	20.5	SSW	247.1	10	Ci.-S.	Fr.-N. SW	.3
4.	55.04	26.8	32.7	24.7	79.2	20.6	S	319.1	8	Ci.-S.	Fr.-N. SSW	.8
5.	57.72	27.2	33.4	24.1	82.2	21.8	S	172.1	7.2	Ci.-S.	N. S, SW	d a. ↙ p.
6.	58.60	27.4	33.5	23.9	78	20.8	S, N	105.4	3.5	Ci.	Cu.-N., N. SW	⊕ p.
7.	58.58	27.2	32.4	23.5	82	21.9	N	86.3	6.2	Ci.	N. S	⊕ a. ↗ ↘ p.
8.	58.16	27.7	34.5	23.4	77.7	21	WNW, NNW	107.2	4.7	Ci., A.-Cu.	Cu. SW	⊕ a. ↗ ↘ p.
9.	57.13	27.3	34.4	23.5	84.8	22.4	NNW	100.2	7.3	Ci.-S.	Fr.-Cu., Cu.-N. SW	1.5
10.	55.68	27.1	33.2	23.5	82.7	21.8	SW quad.	117.6	8.8	Ci.-S.	N. S	⊕ a. ↗ ↘ p.
11.	56.59	27.1	31.3	24.9	82.5	21.9	S	200.3	9.3	Ci.-S.	N. SW, S	⊕ a. ↗ ↘ p.
12.	58.70	26.8	33.8	23.6	86.7	22.5	Variable	93.8	6.8	Ci.	Fr.-N. S	↙ p.
13.	59.47	27.2	33.4	22.3	81.7	21.6	NW	94.1	2.5	Ci.	Cu. S	⊕ a. ↗ ↘ p.
14.	59.14	26.7	33	22.8	84.7	21.8	NW quad.	130.3	6.8	Ci.	N. S	⊕ a. ↗ ↘ p.
15.	58.15	26.8	34.1	22.8	80.8	20.6	NW	112.7	7.5	Ci.-S.	Fr.-Cu., cu. sw	⊕ a. ↗ ↘ p.
16.	58.04	27.4	32.4	24.4	81.7	21.9	S	113	8.3	Ci.-S.	N. S	⊕ a. ↗ ↘ p.
17.	58.92	27.3	32.6	23.7	84.7	22.6	S	100.7	7	Ci.	Cu.-N. S	⊕ a. ↗ ↘ p.
18.	59.08	27.2	32.5	23.5	82.3	21.8	N	61.3	6.3	Ci., Ci.-S.	Cu. SW	⊕ a. ↗ ↘ p.
19.	59.17	26.7	32.8	23.5	87	22.4	N	8.5	8.5	Ci.-S.	N. S	7.9
20.	58.90	25	28.4	23.8	94.8	22.3	Calm	106	8.7	Ci.-S.	Cu.-N. NE	26.9
21.	58.08	26.3	32.2	22.9	85	21.4	NE, N	105.2	4	Ci.	Fr.-N., Cu.-N. S, SW	⊕ a. ↗ ↘ p.
22.	58.75	25.8	32.3	22.6	86.3	21	N	80.1	3.3	Ci.	Fr.-Cu. S	⊕ a. ↗ ↘ p.
23.	59.54	26.9	32.6	22.7	82.2	21.3	SW, N	85.5	6.3	Ci., Ci.-S.	Cu. N	20.4
24.	59.11	27	32.8	23.9	85.8	22.6	N	81.2	7.7	Ci.	Fr.-N. NE	14
25.	58.84	26.8	32.2	23.8	87.3	22.6	NE	92.4	4.5	Ci.	Cu. NE	6.1
26.	58.74	27.2	32.4	23.7	85.5	22.6	NE	102	6.5	Ci., Ci.-S.	Cu. E	⊕ a. ↗ ↘ p.
27.	59.60	27	32.3	23	86	22.6	E quad.	107.3	5.7	Ci.	Variable NE	28.2
28.	59.33	27.1	32.8	24.7	87.2	23	NE, NNE	54.1	9.3	Ci.-S.	N. NNE	5.3
29.	59.20	24.7	27.3	23.7	96.8	22.4	Calm	58.3	4.2	Ci.		⊕ a. ↗ ↘ p.
30.	58.64	26.1	32.2	22.9	87.7	21.9	NE					d° ↘ a.
Mean	757.98	26.8	32.3	23.6	84.4	21.8		120	6.8			
Total												115.8

## CALBAYOG.

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied, -1.80 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	754.57	25.3	30.7	22.5	89.3	21.3	WNW	0.7	7.2	Ci.-S.	Cu.-N. NW	16.8	d° a. ● p.
2.	52.40	26.1	27.6	24.1	89.8	22.6	W	2.2	10	Ci.-S.	N. W	11.9	● a. p p.
3.	53.36	26.8	28.6	24.6	84.2	22	SSW	5.3	10	Ci.-S.	Fr.-N. SSW	3.3	p. a. p.
4.	55.45	28	29.9	25.6	77.2	21.6	S	4.2	9.3	Ci.-S.	S.-Cu. SSW		⊙ a.
5.	58.02	28	30.2	24.8	81.3	22.7	SW	2.2	3.7	Ci.-S.	S.-Cu. SSW, SW		
6.	58.72	27.5	31.4	24.3	83.5	22.6	SW	.5	2.7	A.-Cu., Ci.	S.-Cu. W		
7.	58.52	27.4	33.6	22.8	80.2	21.4	SW	.7	5.5	A.-Cu. NNW	S.-cf. WSW		⊙ p.
8.	57.77	28.3	32	24.8	80.8	23	SW	1.3	6.5	A.-Cu. ENE	S.-Cu. WSW		⊙ p.
9.	56.97	28.5	30.8	26.7	79.5	23	SW	1.8	8.2	Ci.-S.	S.-Cu. SW		⊙ p.
10.	55.90	28.4	30.7	27.3	78	22.4	SSW	2	9.5	Ci.-S.	S.-Cu. SW		
11.	56.89	28.6	32	25	77.2	22.2	S	1.5	7.5	Ci.-S.	S.-Cu. SSW		⊙ ⊙ p.
12.	58.86	27.1	33.2	23.7	86	22.7	Variable	.5	6.3	Ci.-S.	Cu. W		⊙ a. ⊙ ⊙ p.
13.	59.06	27.6	34.4	22.8	82.7	22.3	N, SW	.8	2	Ci.	S.-Cu. SW		⊙ p.
14.	58.87	26	32.4	23.3	90.3	22.4	NW	.8	7	Ci.-S.	Cu.-N. NW	.5	⊙ a. ⊙ p.
15.	57.90	28	31.3	25	80.7	22.6	W quad.	1.5	8.8	Ci.-S.	S.-Cu. W		⊙ a. p. ⊙ p.
16.	58	28.6	32.9	24.7	78.5	22.6	SW	1.5	7.8	Ci.-S.	S.-Cu. SW		⊙ a. p. ⊙ p.
17.	58.96	27.3	33.8	24	84.7	22.5	N	.5	6.8	Ci.-S.	S.-Cu., Cu.-N.		⊙ a. p. ⊙ p.
18.	59.04	25.6	31.5	22.9	89.2	21.6	Variable	.5	7.8	Ci.-S.	N. NNW	15.5	⊙ a. ● ⊙ ⊙ p.
19.	59.25	26.8	32.6	23.2	83.2	21.6	NNW	.5	8.3	Ci.-S.	Cu.-N. N	.5	⊙ p.
20.	58.38	25.7	31.5	23.3	88.2	21.5	NNW	.5	8.2	Ci.-S.	S.-Cu. NNW	6.1	● a. ⊙ ⊙ d p.
21.	57.74	25.2	31.6	22.5	90.2	21.4	Variable	.7	7.7	Ci.-S.	S.-Cu. N	7.3	d a. p. ● ⊙ ⊙ p.
22.	58.78	26.4	31.5	22.4	86.2	21.7	SW	.3	6.3	Ci.-S.	S.-Cu. W	2.8	⊙ p.
23.	59.50	26.6	32.1	22.4	86	22	NW quad.	1	3.3	Ci.	Cu. NNW		● a. ⊙ p.
24.	59.10	25.4	32.7	23.2	90	21.6	N, S	.3	5.2	Ci.-S.	Cu., Cu.-N. NNE	20.4	● a. ⊙ p.
25.	58.07	26	30.9	22.6	88	21.9	N	.8	4.7	Ci.-S.	Cu. ENE		⊙ a. ⊙ p.
26.	59.01	25.6	31.6	22.3	88.7	21.4	N	1	3.2	Ci.-S., A.-Cu.	S.-Cu., cu.-N. ENE	4.1	⊙ a. ⊙ p.
27.	59.53	25.9	31.6	22.2	86.5	21.4	N	.7	3.3	Ci.-S.	Cu. NE	2	⊙ a. p. ⊙ p.
28.	58.90	26.2	33.8	22.2	86.3	21.6	N	.8	6.2	Ci.-S.	Cu.-N. N	3.3	⊙ a. ⊙ p.
29.	58.56	25	27.3	23.2	94.8	21.8	N	.7	8.3	Ci.-S.	S.-Cu. NNE	11.7	● a. ⊙ p.
30.	58.10	26	33	21.9	88.5	22	N	.8	2.8	Ci., Ci.-S.	Cu.	27.9	● a. ⊙ p.
Mean	757.83	26.8	31.6	23.7	85	22		1.2	6.5				
Total													134.1

\* Deduced from 5 observations only.

*Meteorological data for first and second class stations—Continued.*

**LEGASPI.**

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	754.81	26.1	31.5	23.2	86	21.4	W	173.9	6.7	Ci.-S.	Cu.-N. NNW, NW	1	d° ●° p.
2.	51.91	25.5	26.2	24.4	91	22.1	W, WSW	371.1	10	Ci.-S.	Fr.-N. NW, W	22.4	● a. p. d p.
3.	51.10	26.2	28.2	24.6	82.5	20.8	SW quad.	609.3	10	Ci.-S.	Fr.-N. SW	21.3	d a. ● a. p.
4.	54.13	25.9	28.3	24.1	86.2	21.3	SW	432.8	9.3	Ci.-S.	N.	21.9	d a. ● a. p.
5.	57.30	26.8	31.1	24.2	81.2	21.1	SW	356.5	4.8	Ci.-S.	N., Fr.-Cu. SW		● a.
6.	58.26	27.9	33	24	78	21.4	SW	201.8	1.5	A.-Cu.	Cu. W		
7.	57.96	28.3	33.1	24.4	77.7	21.6	WSW	240.2	3.8	Ci., Ci.-S.	Cu. W		
8.	57.20	28.3	33	24.9	78.7	22.3	SW	298.1	4.5	A.-Cu.	Cu. S, WSW		
9.	56.19	27.2	31.6	22.3	81.5	21.7	SW		9.2	Ci.-S.	Cu.-N. WSW	14.3	d ●° p.
10.	55.05	26.8	28.4	23.8	84	22	WSW		9.2	Ci.-S.	Fr.-N. WSW	2.3	● a. d p.
11.	56.14	27.4	29.8	25	84	22.8	SW	239	8.7	Ci.-S.	Cu. WSW		∠° p.
12.	58.50	28.3	33.6	24	77.8	21.9	WSW, SW	159.1	3.3	Ci.-S.	Cu. WSW		
13.	58.98	27.4	34	22.9	80.8	21.6	E, ESE	85.9	1.8	Ci.-S.	Cu. E		
14.	58.60	26.4	33	23.8	86.5	22.1	WSW	126.7	6.5	A.-Cu.	Cu. NNW	19.6	● a. p. ∠ p.
15.	57.19	27.2	31.5	24.1	83.2	22.2	SW	322.7	8.7	Ci.-S.	Cu.-N. W	.8	● a. ∠ p.
16.	57.48	28.1	32	25	79.7	22.3	SW	263.3	7.8	Ci.-S.	Cu. SW		∠° p.
17.	58.66	28.4	33.7	24.4	78.7	22.2	SW	138.8	3.2	Ci.	Cu.-N. SW		∠° p.
18.	58.91	28.1	33.3	23.8	81	22.6	N		6.7	Ci.-S.	Cu.	1	∠° p.
19.	59.40	27	32	22.6	84.7	22.2	NE		6.5	Ci.-S.	Cu. ESE	1	∠° p.
20.	58.45	27.7	33.5	24.1	80.8	23	NNE	142.1	4.8	Ci.	Variable NE		∠° p.
21.	57.49	27.7	33.7	21.9	77.2	20.9	E	109.5	.8	Ci.	Cu.		∠° p.
22.	58.50	26.8	34.1	23.5	81.7	21.1	SW	93.5	1.2	Ci., Ci.-S.	Cu. WSW		∠° p.
23.	59.45	27.9	34.3	22.6	78	21.3	NE	101.4	1.5	Ci.	Cu. WSW, NNE		∠° p.
24.	59.13	28.3	34	22.4	76.5	21.5	NNE	114.4	2	Ci.	Cu. NE		∠° p.
25.	58.79	27.8	32.2	24.6	82	22.7	NE, ENE	101.4	5.3	Ci., Ci.-S.	Cu., Cu.-N. E	5.4	d2 ●° ∠ a. p° p.
26.	59.07	28.7	33.8	24.1	78.2	22.6	NE quad.	126.5	1.2	Ci.-S., Ci.-Cu.	Cu. ENE		∠ p.
27.	59.62	28.9	33.8	25.1	77.2	22.5	E	141.3	2	Ci.-S.	Cu. NE, E		
28.	58.99	28.4	34.5	24.5	76.8	21.6	NE	177.8	3.8	Ci.	Cu. ENE	8.1	● ∠ a. p.
29.	58.54	27.7	33	24.6	83.3	22.7	NE	112	7.5	Ci.-S.	N. NE	.3	● a. ∠ ●° p.
30.	58.01	28.1	34.2	22.9	80.3	22.3	E	65	2.2	Ci., Ci.-S.	Cu. E		∠° a.
Mean	757.46	27.5	32.3	23.9	81.2	21.9		204	5.2				
Total												119.4	

ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.	Upper.			Lower.	
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.			
1.	755.22	26.6	31	22.7	81.7	20.8	SW	259.9	6.5	Ci.-S.	SE	Cu. NW, NNW	2.8	☉ a. ☉ d° p.	
2.	52.51	26.7	30.3	23.7	81.8	21.3	SW	217.9	10	Ci.-S.		S. NW	18	☉ a. p.	
3.	50.49	26.2	27.5	24	85	21.4	SW	519.9	10	Ci.-S.		S.-Cu. WSW	26.9	☉ a. d° ☉ a. p.	
4.	52.33	26.9	28	23.7	84.2	20.9	S	484.3	10	Ci.-S.		S.-Cu. wsw, ssw	10.4	d° a. ☉ a. p.	
5.	56.24	26.5	30.7	23.5	83.2	21.2	S	236.4	8.7	A.-Cu.	SW	S.-Cu. SW		☉ p.	
6.	57.82	27.3	31.7	23.1	83.7	22.4	SSW, SW	196	4.3	A.-Cu.	SW, W	S.-Cu., Cu. SW		☉ p.	
7.	57.76	27.6	32.9	24	79.2	21.2	SW	199.7	3.8	Ci.-Cu.	NE	Variable		d2 ☉ p.	
8.	56.87	27.7	33	23.9	78.8	21.6	SW	284.4	8.2	A.-Cu.	NE, E	S.-Cu.	W	d2 ☉ p.	
9.	55.54	26.8	31.2	23.6	79.7	20.7	SW	410.3	9.7	Ci.-S.		N.	W	16.5	d2 ☉ ☉ p.
10.	54.28	25.9	26.6	24.2	86.5	21.5	SW	385	10	Ci.-S.		S.-Cu., N. SW	7.7	☉ d° a. p.	
11.	55.45	24.8	26.2	23.2	91.3	21.2	SW	214.1	10	Ci.-S.		S.-Cu., N. SW	3.8	☉ a. d° p.	
12.	58.02	27	31.8	23.1	83.5	22.1	SW	205.6	7	Ci.-S.	ENE	Cu., S.-Cu. SW		☉ p.	
13.	58.93	27.6	33.1	23.3	82.2	22.3	SW	163	2.8	Ci.		Cu. SW, NW		b ≡ a. ☉ p.	
14.	58.91	25.7	27.9	24.6	89.7	22	SW	192.5	7.8	Ci.-S.		Cu.-N. NE	7.1	☉ d° ☉ a. p.	
15.	56.76	27	31.1	23.7	83.3	22	SW	220.9	10	Ci.-S.		S.-Cu. W		d° p.	
16.	56.55	28.3	32.2	26.2	74.8	21.3	SW	391.5	9.5	Ci.-S.		Cu. SW		☉ a. ☉ p.	
17.	58.28	28.4	33.2	24.9	80.8	23	SW	171.4	7.7	A.-Cu.	SW	Cu. SW		☉ a.	
18.	58.79	27.3	32.4	23	82.7	22	SW	169.4	9.2	Ci.-S.	NE	Cu., S.-Cu. SW		☉ p.	
19.	59.39	27.2	30.8	23.5	84.5	22.5	SW, NW	263.7	7.5	A.-Cu.	E	S.-Cu., Cu. NE	1	☉ p.	
20.	58.72	26.2	29	23.4	86.7	21.8	N	256.3	7.2	Variable		S.-Cu. NNE, NE	3	☉ a. p. ☉ p.	
21.	57.62	26.5	30.8	23	85.5	21.8	NW quad.	223.8	4.3	Ci.		Cu. NE, N.		☉ p.	
22.	58.39	26.9	31.4	22.9	84.5	22	SW	196	3.3	Ci.		Cu., Cu.-N. SE		☉ p. a. ☉ p.	
23.	59.52	27.2	30.9	22.8	83.2	22	NE	223.5	4.5	Ci.-S.	E	Cu. SE	2	☉ ≡ a. ☉ p.	
24.	59.47	26.8	29.8	23.5	85.8	22.4	N quad.	391.5	5.2	Ci.		S.-Cu. NE	1.8	☉ a. p. ☉ p.	
25.	59.16	26.5	27.8	24.4	86.3	22.2	N	290.9	9.2	Ci.-S.		S.-Cu. NE	18	☉ a. p. ☉ p.	
26.	58.99	28.2	31	26.2	82	23.2	N	327.8	5.8	A.-Cu.	NE	Cu., S.-Cu. E, NE	8.1	☉ a. ☉ p.	
27.	59.71	28.2	30.8	24.4	80.7	22.9	N		5	Ci.		Cu. NE quad.		☉ a. ☉ p.	
28.	59.36	27.6	30.5	26.3	82	22.4	NE, N		3.5	Ci.		S.-Cu., Cu. NE, E	3.8	☉ a. ☉ p.	
29.	58.84	26.4	29.2	23.4	85.3	21.8	Variable		8.3	A.-Cu.	NE	S.-Cu. NE, N.	19.5	d° a. ☉ p.	
30.	58.30	27.4	30.4	23.6	84.8	22.9	NE		5.3	Ci.		Cu. NE	21.3	d2 ☉ a. ☉ p.	
Mean	757.27	26.9	30.4	23.9	83.4	21.9		272.9	7.1						
Total													171.7		

## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5 meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.	Upper.	Lower.	
1.	755.38	26.2	31.4	21.5	87	21.9	NE, S	1.2	7.8	Ci.-S.	S.-Cu. SW	1.3
2.	53.29	26.4	30	23.4	87.8	22.4	WSW	1.5	9.7	Ci.-S.	S.-Cu. WNW	28.2
3.	50.90	26	28	23.2	91.2	22.7	WSW	2.8	10	Ci.-S.	N. W	32
4.	52.16	26.4	29	24.6	86.2	22	SW	3.3	9.8	Ci.-S.	Cu.-N. SW	4.9
5.	56.05	27.2	29.5	25	83.8	22.5	SW	3	9.3	Ci.-S., A.-Cu. W	N. SW	3.8
6.	57.77	27.6	32	23.1	80.8	22	SW, SSW	1.7	5.8	Ci.-S.	Cu. SW	0.4
7.	57.98	27.7	34	22.1	79.3	21.5	W	1.2	6.7	Ci.-S.	Cu. SW	0.4
8.	57.36	27.2	31.8	23.7	84.5	22.4	WSW	1.7	8	Ci.-S.	S.-Cu. SW	4.6
9.	56.21	26.4	28.8	23.9	90.5	23.2	WSW	2.7	9.5	Ci.-S.	N. SW	58.2
10.	54.41	25.6	27	23.8								224.2
11.	55.16	25.5	27	23.1	91.3	21.6	SSW	3	9.8	Ci.-S.	N. SW	6.6
12.	57.77	26.5	30.6	22	85.7	21.9	S	1.5	7.7	Ci.-S.	Cu. SW	
13.	59.09	27.2	32.2	22	81.2	21.6	SSW	1	5.2	Ci.-S.	Cu. SW	
14.	59.03	27.3	31	24	85.8	23	Variable	1	7.7	Ci.-S.	Cu., Cu.-N. W, NE	
15.	57.35	27.5	30.9	24.5	82.5	22.5	SW	2.2	8.5	Ci.-S.	S.-Cu. W	1.5
16.	56.71	27.8	29.9	24.5	87.3	23.4	WSW	2.7	9.2	Ci.-S.	Cu.-N. W	12.7
17.	58.14	27.8	32.5	24.2	81	22.2	SW	2.3	8.3	Ci.-S.	S.-Cu. W	
18.	58.65	27	33.9	23	84	21.9	E	1	6.5	Ci.-S.	Cu.-N. SW	
19.	59.09	26.9	32.2	23.5	83.8	22	NE	1	6.2	Ci.-S.	Cu. SE	1.5
20.	58.64	27.3	33	22.5	79.7	21.1	ENE	1	5.2	Ci.-S.	Cu. SE	
21.	57.29	26.5	33	22.3	85.8	21.8	ENE	1	5.2	Ci.-S.	Cu. SE	11.2
22.	58.20	27.2	34.3	22	84.2	22.3	SW	1	5.3	Ci.-S.	Cu. SE	
23.	59.25	26.9	34.4	22.4	85	22	ENE	1	6.3	Ci.-S.	Cu. SE	8.4
24.	59.10	26.1	32	22.5	86.3	21.6	ENE	1.5	5.7	Ci.-S.	Variable E	2.3
25.	58.92	25.4	29.1	22.5	87.3	21	ENE	1.2	7.5	Ci.-S.	S.-Cu. E	19.6
26.	58.80	26.2	32.1	23.9	87.8	22.1	ENE	1	7.3	Ci.-S.	Cu. E	12.2
27.	59.48	26.1	32.6	22.5	85.3	21.3	ENE	1	6	Ci.-S.	Cu. E	
28.	59.09	26.4	31.5	22.5	83.7	21.2	NE	1.3	5.7	Ci.-S.	Cu. E	
29.	58.70	26.2	33.2	21.6	83.5	20.8	NE	1	6.3	Ci.-S.	Cu. E	
30.	57.97	27.9	34	23.1	81	22.3	NNE	1.2	5.8	Ci.-S.	Cu. E	2
Mean	757.26	26.7	31.4	23.1	84.9	22		1.6	7.3			
Total												435.2

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	755.17	26.7	30.1	23.7	88.7	23	W	131	7.7	Ci., Ci.-S.	Cu. N	41.1
2.	52.31	25.4	27	23.2	95.5	23	SW	217.4	10	Ci.-S.	N. NNW	47.3
3.	49.88	26.1	28.8	24	88.2	22.1	SW, WSW	423.9	10	Ci.-S.	S.-Cu. W	8
4.	52.31	26.8	30.3	23.8	85.5	22.2	SW	332.9	10	Ci.-S.	Cu. SW, SSW	12.4
5.	56.12	27.3	31.8	23.6	84.5	22.6	SW	244.6	6	Ci.	Cu. SW	d° p.
6.	57.94	27.9	33.1	23.5	83	22.8	SW	149.4	1.8	Ci.	Cu. SW	d° p.
7.	57.68	28	33.2	24	81.5	22.6	SW	187.4	4.2	Ci.	Cu. SW	d° a. p.
8.	56.68	28.5	33.6	25.2	78.7	22.5	SW	319	7.7	Variable	Cu. SW	
9.	55.51	26.7	31	22.1	86.3	22.4	W	315.4	10	Ci.-S.	Cu. SW	29.9
10.	54.26	26.4	28.6	24.5	84.2	21.6	SW	271.2	10	Ci.-S.	Cu. SW	d° p.
11.	55.41	26.7	28.6	26	87.5	22.8	SW	169.6	10	Ci.-S.	Cu. SW	1
12.	58.24	27.8	33.4	25	83.7	23	SW	145.2	7.2	Ci.-S.	Cu. SW	d° a. p.
13.	59.01	27.6	33.1	24	81.8	22.1	WSW	130.7	7	Ci.	Cu. W, WSW	
14.	58.77	26.3	29.3	24.1	89.2	22.6	Variable	112.5	9.3	Ci.-S.	Cu. W	10.4
15.	56.45	27.1	30.8	25.1	85.7	22.8	SW	344.7	10	Ci.-S.	Cu. SW	d° p.
16.	56.46	28.5	33.3	25.2	79.8	23	SW	292.1	10	Ci.-S.	Cu. SSW	d° p.
17.	58.51	28	34	24.5	85.2	23.6	SW, NE	114.3	8.2	Ci.-S.	Cu. SW	d° a. p.
18.	59	27.2	31.6	24.2	85.7	22.7	SW	87.3	10	Ci.-S.	Cu. SW	d° a. p.
19.	59.56	27.4	32.5	23	85.8	23	ENE	135.4	8.7	Variable	Cu. NE, ENE	d° a.
20.	58.82	26.4	30.2	24	90.2	22.9	NE	100.5	7	Ci.	Cu. NE quad.	10.2
21.	57.86	27.1	31.6	23	86	22.6	ENE	111.4	3.3	Ci.	Cu. NE	d° a.
22.	58.58	27.4	32.2	23	84	22.5	E, NE	114.5	2	Ci.	Cu. NE	d° a.
23.	59.76	27.4	31.4	23	83.5	22.2	NE	121.6	5	Ci.	Cu. NE	d° a.
24.	59.57	27.8	32.3	24	82.8	22.7	E	164.9	7	Ci.	Cu. NE	d° a.
25.	59.44	26	29	24.3	92	23	ENE	192.9	10	Ci.-S.	S.-Cu. NE	5
26.	59.30	27.3	32	23.2	87.5	23.4	ENE	141.6	6.2	Ci., Ci.-S.	Cu. E quad.	41.8
27.	60.01	27.2	32.3	23.1	86.7	23.1	ENE	132.4	2.8	Ci.	Cu. E	8.1
28.	59.65	27.9	32.5	24.5	82	22.7	E	159.3	3.8	Ci.	Cu. NE	2.5
29.	59.01	26	30.5	24.2	91	22.6	ENE	92.6	8	Ci., Ci.-S.	Cu. NE	24.5
30.	58.48	27.5	32.2	23.6	85	23	NE	109.7	4.2	Ci.	Cu. NE	d° a. p.
Mean	757.32	27.1	31.3	24	85.7	22.7		185.5	7			
Total								5,565.4				231.5

\* This is an approximate height of the barometer above sea level.

## Meteorological data for first and second class stations—Continued.

## SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied,  $-1.69$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).		Form and its direction.	Upper.			Lower.	
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.			
1.	756.14	25.7	32.9	21.6	90	22	WNW	1.3	6.5	Ci.	ESE	Cu.	WNW	0.3	≡ a. □ d p.
2.	53.80	25.9	31.4	23	91.5	22.6	W	1.8	8.5	Ci.-S.		Cu.	WNW	39.9	d ● □ ∠ p.
3.	50.66	24.1	25.4	22.8	98.2	22	SW quad.	3	10	Ci.-S.		N.	W quad.	59.3	● a. ●² p.
4.	51.64	24.4	26.8	22.5	95.2	21.6	SSW	2.7	9.3	Ci.-S.		N.	SW	3.1	● d a.
5.	55.65	26.5	24.4	24.1	88.5	22.7	SSW	4.8	7.5	Ci.-S.		Cu.-N.	SW	4.6	○ ● a. √ d p.
6.	57.98	26.4	30.5	23.9	92	23.5	SSW, SW	1.5	7	Ci.		Cu.	SW		
7.	58.37	27.1	31.9	23.5	87.5	23.2	SW	1.3	6.3	A.-Cu.	W	Cu.-N.	SW	1.5	△² ● a. □ d p.
8.	57.77	26	32.6	22.6	92.2	23	SW	1.8	8.5	Ci.-S.		Cu.	SW	35.1	● a. □ ∠ √ p.
9.	56.13	26	30.4	23.8	94.7	23.6	W quad.	1.3	9.2	Ci.-S.		Cu.-N.	WSW	1.9	○ ● ∠ p.
10.	54.34	25	26.6	23.3	96.5	22.8	SW	3.2	10	Ci.-S.		N.	SW	28.1	d a. ● p.
11.	54.90	24.5	23.2	22	94.3	21.5	SSW	4	10	Ci.-S.		N.	S, SSW	51.9	d a. p.   △² p.
12.	58.10	25.7	30.6	21.9	91.3	22.4	S	2.7	7.3	Ci.-S.		Cu.-N.	SW	.8	● a. d p.
13.	59.67	27.5	32.6	23.2	85.5	23	SW	1.5	4	Ci.		Cu.	SW	6.4	△² a. ● ∠ ∠ p.
14.	59.39	27.2	30.8	24.1	87.5	23.2	WNW	1.5	6.8	Ci.	ESE	Cu.-N.	NW		○ a. p. ∪ ∠ p.
15.	57.64	25.9	28.1	24.6	91.8	22.8	W	1.8	9.5	Ci.-S.		Cu.-N.	NW	7.1	d a. p.
16.	56.63	24.8	26.5	24	97.7	22.8	SW	2.5	9.3	Ci.-S.		N.	WSW	23.9	d a. p. ● ∪ p.
17.	58.18	26.9	30.4	24.5	90.7	23.6	SSW	2.8	8.2	Ci.-S.		Cu.-N.	SW		△² a. p. □ d p.
18.	58.98	27.2	32.6	23.6	87.2	23.2	S	1.8	6.5	Ci.		Cu.-N.	SW		● a. ∪ p.
19.	59.65	26.6	32.1	23.6	92	23.7	SE	1	7.5	Ci.		Cu.-N.	E	7.4	△² a. △² p.
20.	59.21	26.2	32.5	23.5	91	22.8	SE, N	1.3	5.8	Ci.	NE	Cu.-N.	E	8.7	≡ a. ● ∠ ∠ p.
21.	57.82	27.1	33.5	22.7	86.8	22.8	N, SE	1	5.8	Ci.		Cu.-N.	E		≡ a. p. □ d p.
22.	58.58	27.8	33.4	23.8	83.7	22.7	S	1.5	5.2	Ci.		Cu.	E		● a. □ d p.
23.	59.80	27.2	33.6	23.6	86.2	22.6	NNW	1.3	4.2	Ci.		Cu.			△² a. ∠ p.
24.	59.63	26.5	32.8	23.6	88.7	22.7	NE	1.5	4.2	Ci.		Cu.-N.	ENE	8.6	△² a. ● p.
25.	59.72	25.8	30.9	22.9	90.3	22.1	NE, SE	1.3	6.7	Ci.	NE	Cu.	ENE, E	11.7	△² ≡ a. ● ∠ ∠ p.
26.	59.57	26.1	31.2	22.6	90.7	22.6	NE, N	1.8	5.5	Ci.	ENE	Cu.-N.	E		d ∠ p.
27.	60.32	25.8	31.9	22.3	88.8	21.8	NE	1.5	5	Ci.		Cu.-N.	E	.8	△² ≡ a. ● ∠ p.
28.	59.73	26.5	33.1	21.4	82	20.5	N, SE	1.5	2.7	Ci.		Cu.-N.	E		△² ≡ a. ∠ p.
29.	59.11	26.9	33.2	22.1	84.2	21.8	N	1.5	4.8	Ci.		Cu.-N.	NE		△² a. ∠ p.
30.	58.47	28.3	34	23.7	81.8	23	N, SE	1.5	5.7	Ci.		Cu.-N.		.8	● a. ∠ ∠ p.
Mean	757.59	26.3	31	23.2	90	22.6		1.9	6.9						
Total														301.9	

## DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied,  $-1.67$  mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum. <sup>a</sup>	Prevailing direction.			Total movement in 24 hours.	Form and its direction.					
									Upper.		Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	755.45	26.8	31.9	22.2	85.5	22.2	N quad.	179	3.8	Ci.	Fr.-N.	NE	0.3	d <sup>2</sup> p.
2.	52.84	27.6	32.3	22.7	85	23.2	NW quad.	198.1	8	Ci., Ci.-S.	N.	NW	6.8	≡ a. d ● p.
3.	49.03	25.1	26.8	23	94	22.3	WSW	380.1	10		N.		316.7	□ a. ● <sup>2</sup> a. p.
4.	50.32	24.7	26.8	22	89.5	20.6	W	316.8	10	A.-S.	N.	W	22.1	● <sup>2</sup> a. ● p.
5.	54.55	25.9	31.1	22	88	21.8	SW, SE	207.7	9.7	A.-S.	N., Fr.-N.	W	5.5	● <sup>2</sup> d <sup>2</sup> a. p.
6.	57.15	26.9	32.5	23.4	87	22.8	Variable	155	7.3	Ci.	Fr.-N., N. sw, w		5.6	d <sup>2</sup> a. d p.
7.	57.69	27.2	32.3	23.5	84.8	22.6	NW, E	148.1	7.7	A.-Cu.	S.-Cu.		5.6	d ● p.
8.	56.98	25.4	32.1	23.5	89.3	22.7	N, NW	129.9	9.7	A.-Cu.	S.-Cu.	W	8.4	d   a. ● a. p.
9.	55.19	26.8	31.2	24	90	23.5	W		9.8	Ci.-S., A.-S.	S.-Cu.	W	7.9	● a. p.
10.	53.21	25.2	28.6	22.4	91.7	21.7	SE, SW	145.3	10	A.-S.	N.	W	77.3	● a. ● <sup>2</sup> p.
11.	53.81	24.4	28.2	22.1	93.7	21.4	SE	241.3	10	A.-S.	N.	S quad.	40.2	● a. p.
12.	57.06	26.3	32.4	22	86	21.8	SE	232.4	8.7	A.-Cu.	N., S.-Cu.	SE		d <sup>2</sup> p.
13.	58.97	28.1	33	23.6	82	23	SE	195.8	3.8	Ci.	Cu.			∠ p.
14.	58.76	28	33.9	24.8	81.5	22.9	NW	241.3	8.7	A.-Cu., Ci.-S.	S.-Cu.		56.4	d a. p. ∪ p.
15.	57.03	25.9	27.8	22.5	92.2	22.8	NW quad.	220	9.8	A.-S., A.-Cu.	N.	NW	151.9	□ a. ● <sup>2</sup> a. p.
16.	55.83	24.3	25.6	22.1	95.5	21.5	Variable	125.8	10	A.-S., Ci.-S.	N.	NW	140.5	● <sup>2</sup> a. p.
17.	57.35	26.2	30.8	22.5	90	22.8	SE	122	9.7	A.-S.	N.	W		d <sup>2</sup> a.
18.	58.18	27.1	33.5	23.2	86.8	22.9	SE, E	176.1	9.2	Ci.-S.	S.-Cu.	SE, SSE		∠ p.
19.	58.99	27.8	34.1	22.9	83	22.9	SE	206.3	7.2	Ci.-S.	N.	NW	.5	● a. ● p.
20.	58.44	28	31.7	23.5	80.8	22.6	NW	207.1	5	Ci.	S.-Cu., Cu.			∠ <sup>2</sup> p.
21.	57.14	28.4	35.3	23.1	81.5	23	Variable	173.3	5.3	Ci.	S.-Cu.	SE	3	∠ ∪ □ p.
22.	57.76	28.3	33.9	23.7	81.8	23.1	E, W	190	5.3	A.-Cu.	Cu., Cu.-N.		80.8	∠ ● <sup>2</sup> p.
23.	59.08	27.8	32.8	23.1	83.2	23	E, NW	172.1	6.8	Ci.	S.-Cu.	SE		∠ ∪ p.
24.	58.90	28.3	33.9	23.5	79.8	22.4	SE, NNW	167.4	2.5	Ci.	Cu.			∠ a.
25.	58.71	27.7	34.2	23	81	22	S quad.	158.8	5.8	Ci.	N.	SE	7.6	∠ a. □ ∠ ∪ ● p.
26.	58.80	26.8	33	22.5	82.5	21.3	SE	176.7	5.2	Ci.	Variable		1.8	● p.
27.	59.40	26.8	34.2	22.7	83.2	21.5	SE by S	158.8	3	Ci.	S.-Cu., Cu.			∠ a. ∪ d ∠ p.
28.	58.88	27.7	35.3	21.5	79.3	21.4	S quad.	175.3	2.8	Ci.	Cu.		.5	□ a. ∪ d ∠ p.
29.	58.42	28.2	33.3	23	79	22	NW	92.8	3.7	Ci.	Cu.			d ∪ p.
30.	57.76	28.2	35.1	23.5	81.8	23.1	E quad.	117.9	3.2	Ci.-S.	S.-Cu.			
Mean	756.72	26.9	31.8	22.9	85.6	22.4		186.6	7.1					
Total													934.4	

\* The minimum temperatures seem to be too low by about  $1^{\circ} C$ .

## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).		Form and its direction.			
											Upper.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	755.72	27.2	31.7	23.9	85.8	23	SSE	2.2	9.8	Ci.	Cu. NW	9.1	● a. p. p. p.
2.	53.04	27.2	31.9	24.1	86.7	23.1	SSW, N	2.5	10	Ci.-S.	Variable	25.4	● a. p. p. p.
3.	49.49	25.4	26.5	23.9	94.5	22.8	NW, WNW	6.2	10	N.	N.	433.8	● a. p. p. p.
4.	49.84	24.1	25.1	22.6	95.2	21.2	SW	7.8	10	N.	N.	107.7	● a. p. p. p.
5.	54.08	25.3	28.9	22.6	93.2	22.3	SW	5.8	10	Ci.-S.	N.-cf. SW	32.8	● a. p. p. p.
6.	57.10	26	30.1	24.3	89.8	22.4	S quad.	2.7	10	Ci.-S.	S.-Cu.	7.6	● a. p. p.
7.	57.83	26	29.7	24	90.5	22.6	SSE	2.8	10	Ci.-S.	N.-cf. WSW	14.5	● a. p. p. p.
8.	57.14	26	28.6	24.5	92.8	23.3	WSW	3.2	10	Ci.-S.	N.-cf. W	16.1	● a. p. p. p.
9.	55.46	27.8	31.6	25.5	88.5	24.4	W	3.7	10	Ci.-S.	N.-cf. W	5.8	● a. p. p. p.
10.	53.02	25.3	28.5	23	93.8	22.5	W	3.7	10	Ci.-S.	N.-cf. W	45.3	● a. p. p. p.
11.	53.27	24.1	26.6	23.1	94	21	S	4.5	10	Ci.-S.	N.-cf. N.	46.5	● a. p. p. p.
12.	56.70	25.9	29.9	23.1	87.7	21.7	S quad.	4.7	9.3	A.-Cu., Ci.-S.	N.-cf. SSW, S	3	● a. p. p. p.
13.	59.25	27.5	32.9	24	83.7	22.6	S quad.	2.3	8	Ci.-S.	S.-Cu.	3	● a. p. p. p.
14.	59.27	27.8	32.1	24.5	85.7	23.8	WNW	2.7	9.8	Ci.-S.	Cu.	76.8	● a. p. p. p.
15.	57.56	27.2	29.3	26.1	88.3	23.7	WNW	4	10	Ci.-S.	N.-cf. NW	68.6	● a. p. p. p.
16.	55.68	25.2	26.5	23.4	95	22.6	W quad.	2.8	10	Ci.-S.	N.-cf. N.	4	● a. p. p.
17.	57.21	26.2	29.2	24.4	92.2	23.2	S, SSE	3.8	10	Ci.-S.	N.-cf. SW	4	● a. p. p.
18.	58.19	27.1	31.9	24.4	86.5	23	S	3	10	Ci.-S.	Cu. S	4	● a. p. p.
19.	59.25	27.2	31.9	22.7	85.5	22.8	S quad.	2.3	7	Ci.-S.	Cu. N	3	● a. p. p.
20.	58.83	27.5	32.5	23.2	84.2	22.8	N quad.	2.5	8.7	Ci.-S.	Cu.	3	● a. p. p.
21.	57.40	27.8	32.3	23.6	83.7	23	Variable	2.5	6.8	Ci.-S.	Cu.	3	● a. p. p.
22.	58.17	27.6	32.6	24.4	84	22.9	S	2.5	6.8	Ci.-S.	Cu.	3	● a. p. p.
23.	59.41	27.9	32.5	23.6	82.3	22.9	SE quad.	2.7	8.7	Ci.-S.	S.-Cu.	3	● a. p. p.
24.	59.13	28.2	33	24.4	82.8	23.3	SE quad.	2.7	8.8	Ci.-S.	S.-Cu.	3	● a. p. p.
25.	58.95	27.8	33.5	23.6	80.2	22.1	S quad.	2.3	9.2	Ci.-S.	Cu. SSW	3	● a. p. p.
26.	58.85	27.9	33.6	24.3	81.3	22.5	SE quad.	3.2	8.7	Ci.-S.	Cu.	3	● a. p. p.
27.	59.55	27.7	33.5	24.4	80.5	21.9	SSE, ESE	2.8	7.5	Ci.-S.	S.-Cu.	3	● a. p. p.
28.	59.18	27.8	33.1	22.5	80.3	22.1	SE quad.	2.3	7.2	Ci.	S.-Cu., Cu.-N.	5.1	● a. p. p.
29.	58.77	28.2	33.4	23.4	79.5	22.3	S, NW	1.8	5.3	Ci.-S.	Cu.	4.3	● a. p. p.
30.	58.14	28.3	33.5	24.9	81.7	23.2	SE quad.	2.3	7.8	Ci.-S., A.-Cu.	Cu., Cu.-N.	3	● a. p. p.
Mean	756.85	26.8	30.9	23.9	87	22.7		3.3	9.1				
Total												907.8	

## BAGUIO.\*

[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.		
1.	634.18	18	23.3	15	89.7	13.9	Variable	290.8	7.9	Ci.	S	Cu.-N.	30.4	☉ a. ☼ ☼ p.
2.	32.13	18.7	23.1	15.7	87	13.9	W quad.	330.7	8.9	Ci.-S.		Cu.-N.	17.8	☉ a. ☼ ☼ p.
3.	28.20	17.8	19.3	16	98.5	15	W quad.		10			N.	628.8	☉ a. p. ☼ ☼ p.
4.	28.04	16.1	17.6	14	98.5	13.4	WSW	2,200.5	10			N.	276	☉ a. p. ☼ ☼ a. p.
5.	32.85	16.5	17.6	14.3	98	13.7	SW, W	1,492.4	10			Cu.-N.	41.2	☉ a. p.
6.	35.74	16.8	19.2	15.4	98.3	14	SW quad.	644.1	10			Cu.-N.	17	☉ a. ☼ ☼ ☼ p.
7.	36.24	17	19.4	14.9	98.7	14.3	W	371.1	8.7	Ci.		Cu.-N.	38.2	☉ d a. d2 p.
8.	35.42	17.2	17.8	16.3	98.8	14.4	WSW	931.7	10			N.	130.9	☉ a. ☼ ☼ ☼ a. p.
9.	33.91	17.5	18.2	16.6	98.7	14.7	WSW	1,176.4	10			N.	289.8	☉ a. ☼ ☼ a. p.
10.	31.80	16.8	17.8	14.5	98.7	14.1	WSW		10			N.	144	☉ a. ☼ ☼ a. p.
11.	32.06	16.5	17.8	14.5	98	13.7	WSW		10			Cu.-N.	49.5	☉ a. p. ☼ ☼ ☼ p.
12.	35.59	17.8	21.9	14.4	91.5	13.8	Variable		9.7	A.-Cu.		cu.-N. sw quad.	9.9	☉ a. ☼ ☼ ☼ p.
13.	37.54	18.1	23.5	15.5	93.5	14.5	SW quad.		7.9	Ci., Ci.-S.		Cu.-N.		☉ a. ☼ ☼ ☼ p.
14.	37.19	18.3	23	15.5	89.5	14	W quad.	336.4	8.3	A.-Cu.	SW	Cu.-N.	5.8	☉ a. ☼ ☼ ☼ p.
15.	35.15	16.6	17.8	15.8	99.8	14.1	W quad.	797.4	10			N.	190.2	☉ a. ☼ ☼ a. p. ☼ ☼ p.
16.	33.33	16.4	17.1	14.7	98	13.7	WSW	1,537.9	10			N.	142.5	☉ a. ☼ ☼ a. p.
17.	35.90	16.9	18.5	15	95.5	13.7	WSW	667.1	10			Cu.-N.	3.3	☉ a. d a. p. ☼ p.
18.	36.85	18.3	24	15.5	89.8	14	Variable	265	8.9	Ci.	NW	Cu.-N. S, WNW		☉ a. ☼ ☼ ☼ p.
19.	37.52	18.6	25.5	17	88.8	14	E, WSW	323.3	7.3	Ci., Ci.-S. ESE, ENE		Cu.	24.8	☉ a. ☼ ☼ ☼ ☼ p.
20.	37.02	18.5	22.8	15.9	92.5	14.6	SW quad.	223.7	6.9	Ci.-S.		Cu.-N.	4.1	☉ a. ☼ ☼ ☼ p.
21.	36.03	18	23.2	15.5	92	14	WSW	209.1	5.7	Ci.		Cu.-N. SE, W	.5	☉ a. ☼ ☼ d p.
22.	36.52	17.9	23.7	15.7	93.8	14.4	W quad.	212.6	9.4	A.-Cu.		cu.-N. ENE, NNW	3.6	☉ a. p. ☼ ☼ ☼ p.
23.	37.62	18	22.4	15.1	92	14.1	Variable	239.1	6.4	A.-Cu.	NNW	Cu.	8.9	☉ a. p. ☼ ☼ ☼ p.
24.	37.37	17.8	22.5	15.5	94.7	14.4	SW quad.	226.4	6.7	Ci.		Cu.-N.	13.7	☉ a. ☼ ☼ ☼ p.
25.	37.32	18.9	24.2	16.1	86.3	13.9	Variable	271.7	6	Ci.-S.		cu.-N. SSW, ENE		☉ a. ☼ ☼ ☼ p.
26.	37.30	18.2	24.3	15.7	85.8	13.4	Variable	344.1	4	Ci.		Cu.-N. WNW	3.1	☉ d2 ☼ ☼ ☼ p.
27.	37.83	18.6	23.4	15.6	73.7	11.9	Variable	272.8	5.7	Ci.		cu.-N. NW, wsw	6.1	☉ ☼ ☼ ☼ p.
28.	37.37	18.4	23.8	16.1	81.2	12.6	E	209.4	5.3	Ci.		Cu.-N. SSE	11.2	☉ a. ☼ ☼ ☼ p.
29.	37.10	18.3	24.5	15	87.7	13.8	SW quad.	237.6	5.6	Ci.		Cu.-N.	16.5	☉ a. ☼ ☼ ☼ p.
30.	36.59	18.7	24	16	87.7	14.1	WSW	259.3	5.4	Ci.		Cu.-N.	.3	☉ a. ☼ ☼ d p.
Mean	635.26	17.7	21.4	15.4	92.6	13.9		562.8	8.2					
Total													2,108.1	

\* The barometric readings of this station are not reduced to sea level.

*Meteorological data for first and second class stations—Continued.*

**VIGAN.**

[ $\phi=17^{\circ} 34' N$ ;  $\lambda=120^{\circ} 23' E$ ; barometer above sea, 12.2 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Amount (mean).	Form and its direction.	Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.	Km.	0-10.				mm.	
1.	755.74	26.6	30.3	24.5	88.8	22.9	N quad.	142.6	5.7	Ci.-S.	Cu.-N. NNE	0.8	d a. d° 1/4 p.
2.	53.03	27	31.4	24.2	85	22.4	Variable	145.2	7.5	Ci.	Cu. NW	65	4 d 1/2 p.
3.	47.82	25.2	27.7	23.7	96.5	23	N quad.	370	10		N. N quad.	393.3	1/2 1/4 a. 1/2 p. 1/2 p.
4.	46.14	24.8	27	23.2	93.3	21.7	SW	829.7	10		N. SW by S	358.1	1/2 1/2 a. p.
5.	53.26	25.8	27.5	23.4	91.7	22.6	SSW	185.7	10	A.-Cu.	N., Cu.-N. SSW	72.5	1/2 a. d. p. 1/2 p.
6.	56.89	27	30.2	25	83	21.2	SSW		8	A.-Cu.	Cu. SSW	3	d a.
7.	57.71	26.3	29.6	24	89.3	22.6	SSW		10	A.-Cu.	Cu.-N. SW	11.2	d° a. p. d² p.
8.	56.82	26	28.3	24.2	94.2	23.6	SW		10	A.-Cu.	Cu.-N. SW	33.2	1/2 a. 1/4 1/2 p.
9.	55.13	27	28.7	24.4	90.3	23.9	WSW		10	A.-Cu.	Cu.-N., N. wsw	70.3	1/2 1/4 a. p.
10.	52.62	24.6	27.2	22.7	94.2	21.7	SW		10	A.-Cu.	N. WSW	37.1	1/2 a. p. d p.
11.	52.52	25.9	27.5	23.9	84	20.9	S		9	A.-Cu.	Cu.-N. SSW	13.8	1/2 a. d a. p.
12.	56.68	27.2	30.3	24.5	82.3	22	SW		9	A.-Cu.	Cu. SW		d a.
13.	59.27	27.1	31.7	24.6	84.2	23.2	SW		3.2	Ci.	Cu. SW		
14.	59.35	27.1	31	24.7	87.7	23.3	W quad.		7.3	A.-Cu.	Cu.-N. W, NW	8.1	1/2 p 1/2 1/2 p.
15.	57.10	26.3	28.2	23.7	90.7	23	NW	329.8	10	Ci.-S.	Cu.-N. NW	73.7	1/2 1/2 a. 1/2 1/2 p.
16.	54.30	24.4	26.7	22.5	98.3	22.3	W quad.	528.6	10		N. W quad.	345.5	1/4 a. 1/2 a. p.
17.	56.64	26.3	28	23.37	88	22.3	SSW	402.9	10	A.-Cu.	Cu.-N. SSW	1.1	1/2 a. d° p.
18.	58.08	27.4	30.7	23.8	85.3	23.2	SW	193.4	8.7	Ci.-S.	Cu. SSW		d° 1/2 1/2 a. 1/2 1/2 p.
19.	59.39	27.6	31.8	24.1	82.3	22.4	WSW	99	6.8	A.-Cu.	Cu. SW		1/2 a.
20.	58.79	27	30	23.7	85.3	22.6	NNW	192.1	5	A.-Cu.	Cu. NNW		
21.	57.38	27.6	31.7	24.3	82.7	22.6	SW quad.	133.1	3.5	Ci.-S.	Cu. SSW		1/2 p.
22.	58.27	27.9	32.2	24.1	79.7	22	Variable	135.1	2.7	Ci.-S.	Cu.		1/4 d° p.
23.	59.36	27.8	32.8	24.8	85.7	23.6	NW quad.	155.6	3.2	Ci.-S.	Cu. WNW		1/4 d° p.
24.	59.19	27.8	32.5	24.5	82.7	23.8	NNW	151.2	3.2	Ci.	Cu. WNW		1/2 p.
25.	58.97	27.5	31.4	24.8	85	23.1	NW	171.4	4.2	Ci.-S.	Cu. NW	7.1	1/4 1/2 p.
26.	58.95	27.4	31.2	24.4	81	21.9	Variable	174.9	5.7	Ci.	Cu. WNW		1/2 d° p.
27.	59.78	27.7	32.5	24.3	81.8	22.6	Variable	143.8	4.5	Ci.-S.	Cu. NW		d° 1/2 p.
28.	59.18	27.7	31.8	24.1	86.3	23.8	S quad.	131	2.2	Ci.-S.	Cu. SSW		
29.	58.70	28	31.8	24.4	84.8	23.7	NW	143.7	2	Ci.-S.	Cu. NW		1/2 1/4 p.
30.	58.18	27.8	32.3	24.8	84.8	23.6	ESE, WNW	159.4	3.3	Ci.-S.	Cu. WNW		
Mean	756.51	26.8	30.1	24.1	87	22.7		234.2	6.8				
Total												1,491.1	

**TUGUEGARAO.**

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.	0-12.	0-10.			mm.		
1.	756.16	26.5	33.6	23.9	86.3	22.2	NW quad.	1	6	Ci.	Cu.-N. SW, NW	2.8	p p.
2.	53.18	25.9	32.4	23.4	92.3	22.8	NW	1.3	8	Ci., Ci.-S.	Cu.-N.	N	192.4
3.	45.63	25.4	28.4	23.1	95.7	23.1	NW	2.7	10		N.	N	274.6
4.	44.26	24	26	22.2	87.5	19.4	S quad.	4.7	9.5	Ci.-S.	N.	SW	23.9
5.	52.85	27.8	33	23.5	76.3	21	SE	1.3	6.7	Ci.-S.	S.-Cu.	SW	b a.
6.	56.46	27.9	35.6	22.7	82.7	22.8	NW	2	6.2	Ci.-S.	Cu.-N.	NW	b a.
7.	57.14	28.5	35.1	25	86.7	24.8	Variable	5	7.3	A.-Cu.	Cu.-N.	SW	p t < p.
8.	55.93	27.5	32.2	25.1	91.8	25	S	2	7.7	Ci.-S.	Cu.-N.	SE, N	2.8
9.	54.15	27.8	31.1	25	87.8	24.2	Calm		6.8	Ci.-S.	S.-Cu.	SW	3.3
10.	51.94	26.2	28.2	24	90.2	22.8	SE	8	9	Ci.-S.	N.	N	1.5
11.	52.78	26.2	31	23	86.8	21.8	SE quad.	8	9.3	A.-Cu.	Cu.-N.	SW	7.4
12.	57.07	27.1	32.6	23.3	86	22.7	SW	7	7.7	Ci., Ci.-S.	Cu.-N., s.-cu. SW	N	d o a.
13.	59.28	27.9	34.5	24.1	86.7	24	W quad.	1.2	5.8	Ci.-S.	Cu., Cu.-N. Variable	N	b a. a. < t p.
14.	59.02	27.6	33	23.8	83.8	22.9	N quad.	1.3	5.5	Ci.	Cu.	N	23.4
15.	55.35	24.7	28.4	23.3	93.2	21.6	NW	2.3	9.3		N.	NW	147.3
16.	51.67	23.6	24.5	22	90	19.5	S	3.7	9.7		N.	N	18.1
17.	56.22	26.5	31.2	22.5	84.8	21.8	SE, S	1	8.7	Ci.-S.	N.-cf.	S	u p.
18.	58.06	27.4	34.7	22.2	83.3	22.5	Variable	5	6.5	Ci.-S., Ci.	Cu.-N.	SE	p a. t < p.
19.	59.54	27.7	35.4	23	84	22.8	S	1	4.2	Ci.	Cu.	S	≡ a.
20.	58.84	27.8	34.5	23.7	81	22.1	Variable	1	4.7	Ci.	Fr.-Cu.	NW	b a.
21.	57.70	27.4	35.2	23	83.8	22.5	Variable	5	2.7	Ci.	Cu.	S	b a. < p.
22.	58.33	28	35.3	23.6	81	22.2	NW	7	3.7	Ci.	s.-cu., cu. s. NW	N	< p.
23.	59.76	27.5	34.5	23.2	81.3	21.8	Variable	5	5		S.-Cu.	S, N	□ a < p.
24.	60.05	27.2	34	22.5	83	22	SW, N	3	5	Ci.	Cu., Cu.-N. SE, NE	N	□ a < p.
25.	60.14	26.9	33.7	24	81.7	21.4	Variable	5	7.3	Ci.	Cu.-N.	N	□ a < p.
26.	59.83	26.6	35	22.3	86.7	22.3	SE	7	6.2	Variable	Cu.-N., Cu. SW	6.4	b a. a. □ a < p.
27.	60.36	26.6	34	21.5	82.5	21.1	SE quad.	8	4.3	Ci.-S., Ci.	S.-Cu.	S	≡ a.
28.	59.86	27.6	35.4	23	83.7	22.6	Equad.	5	5.3	Ci.-S.	Cu.	NW, SE	≡ a.
29.	59.24	27.1	34	22.7	82	21.7	N	5	4.3	Ci., Ci.-S.	Cu.	N	b a. < p.
30.	58.67	27.7	35.5	23.3	81	22	N quad.	7	5.2	Ci.	s.-cu., cu. E, S	N	< p.
Mean	756.32	26.9	32.7	23.3	85.5	22.3		1.1	6.6				
Total													703.9

## Meteorological data for first and second class stations—Continued.

AFARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied, -1.57 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.	Upper.	Lower.	
1.	756.04	27.1	31.6	24	84	22.3	Variable	240.5	5.5	Ci.	Cu.-N.	58.3
2.	53.20	27.3	31.5	24	87.7	23.6	N	461.1	9.7	Ci.-S.	N.	106.9
3.	45.12	27.8	30.5	24	85.7	23.7	N	1,006.7	10	Ci.-S.	N.	126
4.	41.51	24.1	27.4	22.1	88.3	19.7	S quad.	1,307	10	Ci.-S.	N., S.-Cu.	20.1
5.	52.50	25.9	28.6	23.5	90.8	22.8	S quad.	421.8	10	Ci.-S.	S.-Cu.	
6.	56.18	28.1	33	23.4	79.8	22.5	S	203.1	6.2	Ci., A.-cu. s, sw	S.-Cu.	
7.	56.87	27.9	31.5	24.5	82	22.7	Variable	168.1	7	A.-Cu.	W	
8.	55.56	28.2	31.6	25.1	82.3	23.3	W, NE	111.6	9.8	A.-Cu.	W	
9.	53.94	27	29.5	25.1	85.8	22.8	W quad.	191.9	10	Ci.-S.	S.-Cu.	2.4
10.	51.16	25.5	26.6	24.1	89.3	21.7	S quad.	311	10	Ci.-S.	S.-Cu.	2.3
11.	52.20	26.8	31.5	23.6	81	21	S	344.2	8.2	A.-Cu.	SW	2.5
12.	57.04	27	32	24	83.2	21.9	S quad.	316	8	A.-Cu.	SW	
13.	59.42	27.8	31.7	24	82.5	22.8	NE quad.	265.7	3.7	Ci.-S.	E	
14.	58.92	27.4	30.2	24	84.5	22.9	NW	479.5	7.2	Ci.-S., Ci.	E	
15.	54.96	26.3	28.5	23.8	89.2	22.8	NW	1,000.8	10	Ci.-S.	N.	23.8
16.	47.35						S quad.		10	Ci.-S.	N.	(a)
17.	55.78	26.2	30.5	23.2	84	21.2	SW quad.	319.2	10	Ci.-S.	S.-Cu.	(a)
18.	57.98	27.1	32	24	82.8	22	Variable	175.3	8.3	A.-Cu.	SW, S	
19.	59.56	27.5	31.5	23.8	83.2	22.6	E quad.	205.4	4.3	Ci.-S.	S, SW	
20.	59.09	28	32	25	81.5	22.7	NE	235.9	2.2		Cu.-N.	1
21.	57.68	27.7	31.5	24.3	82.5	22.7	NE, ENE	224	3.2		Cu.-N.	
22.	58.33	28.3	32.1	24.7	81.2	23.1	NE	181.3	.3		Cu.-N.	
23.	60.04	27.6	31.9	23.8	81.8	22.5	NE, W	210.2	.5		Cu.-N.	
24.	60.05	27.6	32.1	23.9	83	22.7	Variable	212.3	3.2	Ci.-S.	E	
25.	60.08	27.5	32	24.4	83.7	22.6	NE, ENE	196.8	2	Ci.-S.	E	
26.	59.36	27.2	32.3	23.9	81.8	21.8	S	269.8	.8	Ci.-S.	SE	
27.	60.12	26.7	32.5	22.1	82.3	21.3	S	291.8	.7	A.-Cu.	SE	
28.	59.63	27.6	32.5	23.8	81.5	22.2	E, S	254.3	.3		Cu.-N.	
29.	59.27	28	31.9	24.6	81.2	22.6	ENE	184.2	.5	Ci.-S.	Cu.-N., S.-Cu.	
30.	58.66	27.7	32	23.5	80.7	22	SW	213.4	1	Ci.	SW, W	4.8
Mean	755.92	27.2	31.1	23.9	83.7	22.4		344.9	5.8			
Total												b348.1

<sup>a</sup> Rainfall for these two days is omitted as the raingauge was submerged by the river in flood.<sup>b</sup> 28 days of observation.

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, SEPTEMBER, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan	17						8.1	6.9			8.4	22.6				1.5
Zamboanga	64.2	13.4								5.3	52.1			6.4		
Davao	70.1	13.3								4.1	3.6			7.9		
Cotabato	3.8						6.4				11.4	14.5	46.2			2
Cagayan, Misamis	33.5	59.2	0.1			12.2	1.3	5.1	15		5.3	1.3	21.1	21.3	.3	
Butuan	6.9	5.6					1.8				4.8			.8	.3	1.3
Dumaguete	5.5	1.3					2									
Yap, W. Carolines	15.7	25.6	3.8	2					5.6					7.9		
Maasin	49.3	28.7			20.1		28.4		2.3	23.1	1.3	5.6	.3		19.3	1.8
San José, Buenavista	17.3	19	20.8										22.9			
Cuyo	19.8	31	36.1	24.1	6.6			.3	10.7	2.3	10.9			13.7	27.5	19.8
Borongan	72.1	9.1		153.4	14.5				2						1.3	.8
Masbate	11	38.3										3		3.6		
Romblon	9.4	24.4	5.4	8.9								1.3		6.6		
Batag	.5	8.9	31.3	24.2	1.3					.5	.8					
Gubat	10.9	33.8											1.8	5.6		
Sumay, Guam	2.5	24.2						3	6.9							
Calapan	9.6			17.8			3.8	2.5	31.7	10.8	21	7.6	11.4	.6	3.2	1.3
Virac			12.2	2	.3				13	36.6	2.3					
Nueva Caceres	52.6	100.6	1.6	3.3									3	44.2		
Batangas	13.5	16.3	4.1	14.7	.3								6.4	.5		
Silang	15.7	.8	6.9	28.5	1.8			1	40.4	81	91.7			1.8		
Santa Cruz, Laguna		19.8	34.3	37	5.1				48.8	25.7	3.8				11.7	22.9
Antipolo	4.6	21.1	5.6	2	6.6				52.3	74.4	30.2	5.3		.8	3.1	1.3
Iba	4.3	33.8	34.5	16.8	15.8			4.6	203.7	180.6	25.4				4.8	19.3
Tarlac	.3	45	141.1	10.5	27.8	5.6	8.6	21.7	85.9	126.5	214.5	9.6		.6	23.8	15.6
Baler	1.5	16	81.3	4.3	.8	.8	1.3	30.5	13.4	47.2	55.9	3		1	13.3	18.5
San Fernando, Union	1.8	24.9	40.4	1						5.3	13.3	.3			4.1	10.7
Echagüe	43.7	16.8	244.4	93	79.5	6.9	10.4	30.8	8.9	138.7	39.4			64.8	100.3	87.1
Candon	4.8	40.4	46.2					10.7	.3		.3			8.1	13.2	9.4
Laoag	12.7	28.7	191.8	254	66.3	5.8	10.9	36.3	26.2	89.4	10.4		6.9	22.9	205.8	203.2
Santo Domingo, Batanes	13.8	89.7	294.8	564.2	64.1		9.1	30.3	68.3	13.7	4.3			3	76	119.8
	17.8	27.9	52	11.3				.3	53.1	160.3	1.8	38.9	2.3	14.6	35	6.3

Station.	Day of month.															Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.		
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Isabela, Basilan	0.3			25.7	12.2	0.5		5.3		0.3	11.7				120.3	
Zamboanga			4.6	19.6	11.2				19	22.1					217.9	
Davao		3.8	2.5	8.9	7.1		0.3	2							124.2	
Cotabato		31.2	.5	14.7	1		35.6	.8	5.3			2.8			177.9	
Cagayan, Misamis			2	1.3	9.1	25.4	32.8	3.3	9.7				5.4	10.9	278.5	
Butuan			.3	1.8	29.2	8.1	10.4	9.9	2.3	1		13.2	5.6		110.5	
Dumaguete				4.6	1.5	5.1			19.8	14.1		.8	3.6		90.7	
Yap, W. Carolines				4.6	1.5	5.1			19.8	14.1		.8	3.6		110.1	
Maasin	14.5	13.8	34.3	7.9	9.9			2.5	9.9	10.5	7.4	27.1	44.9	5.4	368.3	
San José, Buenavista		16.5	39.4	27.4		83.3							16.5		263.1	
Cuyo	19.1	1	1	1.5	130.8	.3		.3	7.7	3		21.6	45.5	3.3	437.9	
Borongan	2.3	1.8	2	17	20.1	12.4	12.4	2.3	14			27.2	13.2	17	394.9	
Masbate	7.1	11.4	.5	8.6		24.4	1	1.5	1	.5	22.6	25.9	8.4		168.8	
Romblon	43.7	22.1	.5	.8		1.8			1			5.8	3.8	1.5	137	
Batag		7.1	32	5.3			2.3	13	1.1	2.8	.3	23.6	3.6	26.2	140.4	
Gubat		24.9	8.4	1.8				2			10.7	30.5	1.3		141	
Sumay, Guam		69.9	49.6	22.9	1.3			1.8	2	5.6	10.7	9.7			101.5	
Calapan			2.3					14	13.3	9.5	.6	6.4	40	42.5	414.1	
Virac			4.8	1.8	.3	.3	10.1		1		.8			.3	77.7	
Nueva Caceres		2.4	74	5.2		.8		38.7		2.1	1.5	9.4	10.9	5.3	250.7	
Batangas			1.3	7.9				11.4	1.6			1.6		.8	203.5	
Silang			2.5					7.9	18	9.1			3.8	.5	296.1	
Santa Cruz, Laguna							.1	.8	6.6		(a)	(a)	4.3	1.8	252.7	
Antipolo			.8		12.4	4.3	6.6	16.8	3	1.8	26.1	1.5	19.8		214.8	
Iba	15.6			23.8		1.2	1.3	2.5	16.7	.3	1.2		4.3	2.2	637.2	
Tarlac	3.1	3.1		9.1		32.3	1		23.6	1.8	3.6				806.2	
Baler	.3			3.3	2			.2			2.5		9.9	15.2	366.4	
San Fernando, Union	13.3			3.6		.3	.3			.1		.3			134.3	
Echagüe		15.2				.8	1.3		1.3	5.1			.8		982.6	
Candon					1.5	2.8	8.6		1.5	1					164.8	
Laoag	27.7								2						1,179.6	
Santo Domingo, Batanes								8.4	9.1	15	12.6		14	16.9	1,380.8	
															497.6	

\* No observation.



## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, SEPTEMBER, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Butuan.		Dumaguete.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
1	30.4	22.6	28.1	22.1			26.8	22	28.3	23.2	26.7	23	25.1	23.1	32.2	
2	31.3	21.7	30.3	22.1			28.8	22.3	29.4	22.2	26.9	22.7	26.8	23	28.2	22.7
3	32.1	24.2	31.6				30.7		31.8	21.4	31.5	23	29.8	22.9	30.8	
4	32.9	23.5	33.1		29.5	24.9	31.2	23.8	33.8	21.3	34.5	22.7	31.5	23.9	32.1	24.8
5	33.9	24.1	33.4	22.1	30.9	24.4	31	22.5	33	22.7	32.7	21.5	31.6	23.6	33	25.7
6	34.4	22.9	33.3	21.1	30	23	32.5	22.8	33.1	22.2	31.5	22.2	31.8	24.4	31	22
7	33.8	23	31.3	20.6	29.5	22.8	33.1	22.2	32.2	23.1	31.6	22.6	30.8	23.6	31.8	22.7
8	32	22.1	31.6	21.1	30.1	23.9	31.6	22	32.3	22	32.1	21.7	30.5	23.1	32.3	22.3
9	32	21.5		21.3	30.9	22	32.9	23.5	31.4	22.5	32.3	23.1	30.5	23.9	33.2	23.4
10	33	22.7	31.4	21.6	30.9	23	31.7	21.7	31.6	22.7	32.2	24	31	24	32.8	22.9
11	28	24.3	29.8	21.5	29.4	23.6	32.2	22.5	30.4	22.7	32.9	22.9	31.8	24.1	32.5	24.6
12	31.8	22.1	31.8	21.3	30.1	21.9	31.9	22.1	32.9	21.8	32.2	22.2	31	23.9	32.2	22.5
13	32	21.7		21.3	30.3	22.6	32.7	21.1	32.2	21.9	32	22.2	31.2	23.6	31.8	23.6
14	28.9	23	29.8	22.7	29.4	23.5	31.2	22.2	32.2	23.2	31.4	23.3	30.3	24.1	30.3	24
15	32.1	22.4	30	22.6	28.5	22.4	31.7	20.8	31.6	21.5	32.1	21.7	31.1	23.6	31.6	23.3
16	32.2	23	31.9	21.1	29.6	22.4	32.3	21.5	32.4	22.1	32.5	21.9	31.2	24.2	32	22.5
17	32.5	21.8	31.9	21.2	29.9	22.5	29.1	22.4	32.2	22.4	32.3	24	31.2	23	33.2	22.5
18	33.6	21.5	31.1	21.6	29.9	22.5	31.5	23.2	32.8	22.8	31.7	22.5	30	23.1	30.9	22.4
19	33	22.7	30.6	21.5	29.9	23.9	32	22	31.4	22.7	30	23	29.5	23.8	30.1	22.8
20	28.9	23.1	28.2	21.9	28.4	24	30.7	22.5	32.3	22.6	30.8	22.7	29.5	23.3	30.8	23.8
21	29.9	21.8	29.8	22.1	28.2	22.5	31.7	22.8	29.5	23.1	28.5	23	27.7	23.6	29.3	22.4
22	32.2	22.7	29.8	22.7	29.7	22.6	30.3	21.9	31.3	22	31.4	22	29.8	23.6	31.5	23.4
23	31.7	23.4	30.6	23.1	29.8	23.2	30.7	23.2	31.7	22.8	30.4	23	29.1	23.4	31.2	23
24	32.9	21.4	30.3	22.5	29.5	22.5	31.2	21.9	31.9	22.5	30.1	22.2	29.5	22.6	31	23.1
25	29.4	22.5	28.6	21.4	27.6	22.8	31.7	20.6	31.6	22.3	30.1	21.9	30.8	23.2	30.9	24.1
26	31	21.3	31.1	22.6	29.6	23	32.5	22	32.5	22	30.4	21.7	31.1	23.1	31	24
27	31.8	21.7	31.6	21.6	30.6	22.5	32.2	21.9	35.3	22.7	31.1	22	30.7	22.9	30.3	23.4
28	32.7	21.2	33.2	22.1	28.9	23.1	31.2	22.5	31.8	22.8	30.9	22.2	30.8	22.9	31.9	23.8
29	31.9	21.8	30.4	21.1	30.1	23	32.3	22.5	31.5	22.9	31.1	22.2	29.2	23.5	30.2	23.7
30	31.2	21.7	31.6	22	30.2	22.5	32.2	21.8	32.7	22.1	30.5	21.8	29.7	23.9	31.3	22.9
Mean	31.8	22.4	30.9	21.8	29.7	23	31.4	22.2	31.9	22.4	31.1	22.5	30.2	23.5	31.4	23.3

Day.	Yap, Western Carolines.		Maasin.		San José Buenavista.		Cuyo.		Borongan.		Masbate.		Romblon.		Batag.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
1	29.8	22.37	29.5	23.8		23	29.7	22.6	30.6		30	25.5	31.6	22.9	28.5	22.9
2	27.7	22.1	29.5	23.4		23.9	27.8	23.4	28	23	30.5		32.4	24.2	25.9	22.2
3	31.3	25.4	29.6			23.6	29.3	23.6	32	22.9	30	25.4	32.3	23.9	28.5	22.5
4	32.2	25.6	30.2	24.6		24.1	30.5	25.7	32.8	24.3	29.8	26	32.1		30.9	23.5
5	27.2	23	31.4	24.4		24.5	29.7	23	34.1	20.97	31	25.5	32.7		31.4	22.7
6	32.6	23.5	31.4	24		23	31.3	22.5	32.2	22	32.8	26.4	33	24.4	31.9	22.6
7	33.2	24.7	30.5	24.6		21.6	31.6	24.4	32.6		32.2	26.6	32.7	24.9	32	22.5
8	32.3	23.4	30.5	23.8		23.1	31.8	24.5	35	22.9	31.2	26.4	34.4	25.7	31	23
9		24.1	30.5	24		25	32.1	25.6	33.1	23.6	31.6	27	33.6	25.5	31.1	23.9
10	30.2	24.37	30.5	23.8		23	30.4	24.2	34.6	22.8	29.8	27.2	33.5	26.1	31.2	24
11	29.9	24	31.7	23.8		26	29.7	26.7	35.2	22.6	30.5	27.47	31.5	24.8	32.8	23.8
12	30.3	25.2	31.1	23.8		24	31.6	24.9	32.1	23.3	34.4	25	33.5		32.9	23.3
13	31.3	24.4	31.7	24		22.4	31.5	23.6	32.6	22.6	32	24.8	33.3	22.8	32.2	22.5
14	31.2	25.2	31.7	22.3		22.1	31.6	24.6	32	21.2	32.2		32.2	23.3	32.3	22.5
15	32	24.5	31.7	22.2		23.2	32.1	26.6	33.5	21.4	31	26.4	33.8	22.7	31.7	22.6
16	32.7	23	31.7			23.8	31.3	25.4	34.2	23.1	31.4	26.5	34.5	26.2	33.1	23
17	31.2	24.8	31.6	22.47		23.5	31.6	24.6	32.5	22.2	32.8	25.4	34	25.5	32	23.9
18	31	23.5	29.6	22.4		22.9	30.8	23.3	31.2		32.4	24.4	33.1	23.4	32	22
19	30.2	24	29.6	22.6		22.4	31.5	24.1	31.8	21.6	32.6	24.8	32.4	22.9	30.9	21.9
20	29.1	23.6	32.2	22.4		23.1	30.6	24.7	31.5	22.5	30.8	26.5	32.8	23	30.5	22.1
21	29.2	23.27	28.8	22.5		22.9	29.4	23.6	31.2	21.6	33.5	25.6	33.2	23.4	31	22.7
22	31.5	22.87	31.5	22.4		22.5	31.3	23.6	31	19.9	31.2	25	32.5	22.2	31.7	21.6
23	31.7	24.2	31.7	22.4		23	31.5	22.9	31.5	21.1	32.6	25.4	33.2	22.2	31.3	21.5
24	33.1	24.7	31.6	23.6		22.3	31	23.6	31.4	20.4	33.2	25.6	33.2	23.1	31.5	23.6
25	29.3	23.3	31.4	23.2		22.4	30.17	25.9	31.5	20.77	32.4	25.5	33	23.4	30.7	23.4
26	29.2	24.7	31.6	23.3		23.2	31.7	24.4	31.5	21.5	33.8	26.4	33.5	24.2	31	23.3
27	31.2	24	30.3	23.4		23	32.2	24	31.2	23	35	26.4	33.3	23.8	30	23.4
28	30.8	23.6	30.3	23.4		22.7	31.3	25.5	31.3	22.5	35		33.7	24.5	29	22.6
29	30.8	23.8	30.3	23.4		23.1	26.1	23.8	31.5	22.2	31.8	25.5	32	23.4	31	22.5
30	31.2	22.27	30	23.2		21.6	29.6	22.9	31.5	21.6	33.5	25.27	33.2	23.9	31	22.7
Mean	30.8	23.9	30.8	23.3		23.2	30.7	24.3	32.2	22.1	32	25.8	33	23.9	31	22.8

## Maximum and minimum temperatures for third-class and rain stations, September, 1913—Continued.

Day.	Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.		Sta. Cruz, Laguna.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1.	32	23.6	27.4	24.3	28.9	24.5	30.4	22	31.3	21.5	31	22.4	31.6	19.5	31.6	22.7
2.	26.8	24.4	29.2	23.1	28.7	23.1	26.8	22.9	27.1	22.1	29.4	23.4	30.2	19.1	30	24.1
3.	29.2	24.2	29.5	25.1	28.3	23	29.2	23.7	28	20.8	28.3	25	29.6	18.4	27.7	23.4
4.	32.2	25.1	30	24.7	28.3	23	30	23.2	28.9		28.5	24	27.8	17.6	29.1	24.1
5.	33.8	25.5	30.9	24.2	29.9	22.6	31.5	23.5	30.3	22	29.4	24.1	26.8	17.9	31.1	24
6.	33.8	24.2	30.8	24.6	32	23.1	32.1	22.3	32.4	23.2	32.2	23.9	28.7	19.2	32.6	23
7.	34.3	24.4	30.8	24.3	31.5	21.8	32	22.3	32.9	23	32.3	22.4	30.5	20.1	32.1	23.5
8.	34.4	25.4	29.3	23.9	30	23.2	32.5	22.2	33.2	23.5	31.6	26.1	30.9	19.7	32.2	23.4
9.	32.1	25.5	29.9	23.8	28.6	23.5	31	23.3	32.3	22.8	30.4	26	30.4	19.8	30.3	25.4
10.	30.3	23.9	30	23.7	29.2	22.5	29.3	23.1	29.3		27.2	23.8	28.1	18	27.4	24.5
11.	33.2	24.8	30.2	24.1	26.2	22.6	32	23.3	30.6	24.5	26.2	22.4	27.2	18.4	27.5	23
12.	35.9	23.6	30.5	24.2	31.1	22.6	32.7	22.5	32.8	22.8	31.3	21.8	29	19.5	32	22.9
13.	34.1	22.9	29.3	24.1	31	22	30.1	22.1	35	21.8	32	22.2	30.8	20	32	21.9
14.	33.5	23.8	30	24.4	29.6		27	21.2	31.8	23.3	29.3	24.6	31.6	20.3	30.8	24.4
15.	33.2	24.9	30.3	24.1	30	25.6	31	22	31.9	23.3	30	26.2	31.9	19.6	29.9	23.5
16.	34.3	25.6	30.9	25.8	32.1	22.5	31.7		31.4	24	31.3	25.8	29.7	19	30.8	25.4
17.	34.7	23.6	29.1	25.9	31.6	22.9	32.2	21.7	33	22.9	32	23.6	28.5	19.8	32.8	24.3
18.	33	23.6	26.4	24.5	31	21.6	32.1	21.5	33.1	22	32	22.4	30.8	19.5	32.8	23.3
19.	30.9	22.6	27.4	21.37	32.2	22.2	29.6	21.3	32.7	22	31.8	23.4	29.1	19.8	33.9	23.3
20.	33.4	22.8	25.9	21.6	32.1	22.2	30.4	22.9	31.6	22	31.6	23.2	29.8	19.2	32.8	23
21.	32.9	22.8	30.5		33	22	30.5	20.7	31.8	20.7	32.3	22.4	30.6	20.3	33.8	22
22.	33.2	22.9	30.4	25	31.3	21	31.3	21.4	34.3	21.7	31.8	22.1	31.2	20.3	33.5	21.5
23.	33.2	22.7	30.1	24.3	32	21.6	30.6	21.6	33.1	21.9	32.3	22.4	30.7	19.6	33.7	22
24.	33.2	22.5	29.9	27.6	32.5	22.1	31.2	21.3	32.1	21.1	32.2	22.8	30.1	19.9	33.5	22.5
25.	32.4	24.2	30.4	26.1	30	22.5	31.6	22	31.1	21.2	32	22.1	29.3	19	29.5	22.5
26.	33.2	24.5	29.9	24.2	31.6	22.5	32	22.3	33.2	21.4	33.8	23.1	28.6	19.1	32.2	22.9
27.	33.1	24.6	30.1	24.3	32.5	22.5	32.5	22	33.4	22.5	33.7	22.3	29	19.5		23.2
28.	33.4	24.1	30.5	25.4	32.2	23	30.5	21.8	33	21.4	32.8	22.5	30.3	20.3		
29.	31.9	24.5	30	24.4	32.5	21.5	28.7	23	32.1	22.9	32.2	21.3	31.4	19.9	33.2	
30.	33.3	22.9	28.3	22.3	32.5	22.5	29.9	21.4	33.3	21.7	32	21.8	31.8	20.7	34	22.2
Mean	32.8	24	29.6	24.3	30.7	22.6	30.7	22.2	31.9	22.3	31.1	23.3	29.9	19.4	31.5	23.3

Day.	Antipolo.		Iba.		Tarlac.		Baler.		San Fernando, Union.		Echagüe.		Candon.		Laoag.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1.	30.3	20.9	30.9	22.4	33.9	21.8	33.5	21.8	31.6	23.6	32.5	23.1	30.7	25.4	31.6	23.9
2.	29.1	21.9	31	22.3	32.7	22.9	34.5	23.1	31.8	22.6	31.7	23.9	29.4	24	32.7	24.4
3.	26	22.4	26.5	22.7	26	22.4	29	23.3	27.4	23.9	27.1	22.7	26.5	25	28.5	23.9
4.	25.8	22.1	27.5	23	26.2	22.2	29.6	23.2	25	22.8	27.7	21.8	24.4	23.5		
5.	28.1	23.1	29.9	24	31	23	33.8	22.3	27.2	22.2	32.5	21.8	25.9	23.6	28.9	
6.	30.2	22.6	30.9	24	31.5	22.7	33.5	23.5	30.9	23.4	35.9	21.8	29.9	23.5	31.3	24
7.	30.6	22.8	31	23.7	32.3	23	33.8	24.7	31.9	24.1	33.6	22.8	29.5	24.4	30.6	24.1
8.	29.6	24.3	30.8	24.1	32.5	23.8	34.4	26.1	30.5	24.2	33.3	23.6	27.4	25.2	30.5	24.4
9.	26.8	23.8	28.5	24	31.2	23.6	33.5	26	31.1	24.9	31.1	23.7	28.2	25.5	29.5	24.8
10.	25.7	22.1	26.6	23.8	26.7	22.5	33.5	25.6	27.7	23.2	29.8	24.7		23.7	26.7	23.2
11.	27.8	21.1	27.9	22.5	27.6	22.2	31.1	23.2	27.2	23	30.4	22.1	26.9	23.7	28.8	23.8
12.	31	20.9	30.6	22.5	29.9	22.4	32.5	22.8	33.4	23	32.8	22	29.7	23.9	31.9	23.5
13.	31.4	21.8	31.1	22.6	33.5	21.8	33.3	22.9	34.4	23.7	33.8	23.4	30.6	23.9	32.2	24
14.	30.3	21.8	31.5	22.3	33.6	23	33.7	24.1	32	24.5	32.8	23.6	30.2	23.9	32.2	23.2
15.	28.6	23.4	29.3	24.4	28.6	23.6	30.5	25.5	29	23.5	27.2	24	27	24.5	28.8	25.1
16.	27.1	23.5	27.8	23	25.7	22	29.4	23.7	27.9	23.6	25.7	22		24.2	26.1	20.5
17.	30.1	22.7	30.5	24.2	31.2	23	33	22.9	29.2	24.2	31.5	22.57	28.6	24.2	28.6	22.6
18.	32.3	22.8	31	23.1	32.2	23	31.5	22.7	32.4	24.8	34.7	21.8	30.5	24.7	31.2	22.3
19.	31.7	22.6	31.2	22	31.6	22.4	31.4	23.2	32.5	23.2	33.3	23.4	30	24.8	31.7	23.9
20.	30.9	22.3	31.2	21.8	34.2	23.4	32.5	23.7	32.9	23.2	33.2	24.4	30.1	24.7	31.6	23.1
21.	31.6	21.4	30.7	22.4	33.4	22.5	33.3	22.2	33.2	22.9	33.8	23.9	29.9	24.8	32.6	23.9
22.	31.9	21.3	31.5	22.4	33.7	23.2	32	22.1	33.2	24.4	34.2	21.8	30.5	24.5	32.2	23.6
23.	32.2	22.2	31.1	22	34	23	32.2	22.2	33	23.7	33.7	23.9	31.5	24.4	32.5	23.3
24.	30	22	31.5	21.9	32.1	22.4	32.3	22.2	32.8	23	31.7	23.4	30.7	24.4	32.8	23.4
25.	29.4	20.9	32.7	21.8	33.4	23	32	22.4	33.1	33.3	31.4	21.8	30.8	24.4	33.8	23.7
26.	31.6	21.9	31.9	21.5	33.4	22	32.8	23.5	32.9	23.4	32.7	22.8	30.6	24.4	32.1	23.5
27.	31.8	21.8	32.2	22	34	21.8	33	22.8	33.7	22.7	32.4	21.4	30.5	24	32.2	23
28.	31.3	21.5	32.1	20.3	33.2	20.8	33.5	22.4	33.6	22.3	34.3	22.5	30.6	24	32.5	22.1
29.	32	20.4	32.8	21.7	34.4	23	34.6	21.7	33.6	23	32.9	22.4	31.5	24.7	33.2	23.5
30.	31.8	21.6	31.9	22.5	34.2	24	32.2	22.6	33.7	23.3	33.9	23.5	31	25.3	32.8	23.2
Mean	29.9	22.1	30.5	22.7	31.6	22.7	32.5	23.3	31.3	23.5	32.1	22.9	29.4	24.4	31	23.5

*Maximum and minimum temperatures for third-class and rain stations, September, 1913—Continued.*

Day.	Sto. Domingo, Batanes.		Day.	Sto. Domingo, Batanes.	
	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.
	°C.	°C.		°C.	°C.
1	31	23	16	29.3	24.8
2	30.5	23.5	17	30	24.8
3	29.4	24.9	18	31.2	23.4
4	29.1	23.9	19	31.3	24.6
5	30.9	24.4	20	32.1	23.6
6	32.1	24.8	21	31.2	24
7	30	25.2	22	31	22.8
8	29.7	25.3	23	30.8	22.9
9	28.8	25	24	29.4	22.8
10	27.6	25	25	30.7	23
11	31.4	23.5	26	32	23
12	29.6	23.7	27	31.9	23
13	30.8	24.4	28	32.5	23.8
14	31.2	23.5	29	31.4	23.9
15	29.3	24	30	30.7	24.2
			Mean	30.6	23.9



# SEISMOLOGICAL BULLETIN FOR SEPTEMBER, 1913.

By Rev. MIGUEL SADERRA MASÓ, S. J.

*Assistant Director of the Weather Bureau.*

## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

4, 15<sup>h</sup> 00<sup>m</sup> 58<sup>s</sup> \* [4, 23<sup>h</sup> 00<sup>m</sup> 58<sup>s</sup>]. **Samar, Leyte, SE of Luzon, and NE of Mindanao.** Earthquake of intensity V; its origin was in the Pacific opposite the eastern coast of Samar, doubtless in the great Philippine Deep. In the E of Samar it was accompanied by subterranean noises, but the intensity there did not pass number V of the scale: it was also felt in the island of Leyte and in the extreme SE of Luzon. In the peninsula of Surigao, in NE Mindanao, the intensity must have been from IV to V for it awoke people from sleep; it was also perceptible in the northern part of the Agusan valley, which is some 80 kilometers from the Pacific coast. There are no records to show whether or not the earthquake was perceptible in the S on the E and SE coasts of Mindanao; but in any case the zone throughout which it was certainly perceptible had an extension of more than 500 kilometers in the N-S direction and more than a 100 from E to W. Although the extension of the shock was so large, for the area indicated only represents a section of the western part of the total area, the intensity was really disproportionate, even supposing it to have been greater in the epicenter than it was 50 kilometers away. That the intensity in the epicenter was not very great is clearly proved by the records of the seismographs in Manila and the limited propagation of the seismic waves, for the earthquake was only registered by the seismographs in Manila and Baguio, no trace of it being recorded outside the Philippines.

15, 12<sup>h</sup> 5<sup>m</sup> [15, 20<sup>h</sup> 5<sup>m</sup>]. **Butuan (N Mindanao).** Oscillatory earthquake, direction ESE-WNW, intensity III-IV, duration 5 seconds.

24, 1<sup>h</sup> 31<sup>m</sup> 40<sup>s</sup> \* [24, 9<sup>h</sup> 31<sup>m</sup> 40<sup>s</sup>]. **W Luzon.** Earthquake of intensity III felt in the northern part of Zambales. Its origin was in the China Sea at a short distance from the W coast of Luzon. At 1<sup>h</sup> 39<sup>m</sup> the seismographs in Manila registered a repetition which apparently was not perceptible within the island.

29, 7<sup>h</sup> 05<sup>m</sup> 9<sup>s</sup> \* [29, 15<sup>h</sup> 05<sup>m</sup> 9<sup>s</sup>]. **E Samar and NE Mindanao.** Oscillatory earthquake of intensity IV-V. Its origin was very probably in the Philippine Deep, but somewhat more to the south than the one of the 4th. Along the eastern coasts of Samar it had intensity III, while in the NE Mindanao where its duration was long, it reached intensity IV-V. Our observer in Butuan noted first of all the series of very weak undulatory movements which lasted about 15 seconds, after which they increased in intensity without losing the undulatory character for about 25 seconds when they again decreased, so that the whole duration was almost a minute. The direction of the movements was from the E and ENE approximately. Although there are no records to show it, it was probably felt on the coasts of E Mindanao and perhaps also in the southern part of the Agusan Valley. The earthquake was recorded by the seismographs in Manila and Baguio but apparently not by any outside the Philippines. This earthquake had therefore something of the characteristics of that of the 4th, namely a large extension, slight intensity and a very limited propagation of the seismic waves of No. 1 of the Rossi-Forel scale, i. e., of those not perceptible to the senses.<sup>2</sup>

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs in the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observers who sent the report. All time indications are in Greenwich mean time (Midnight=0<sup>h</sup>), Insular time being added in brackets for the convenience of Philippine readers.

<sup>2</sup> The Benguet earthquakes of this month were discussed in the August Bulletin.

## RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0h. Instrument: Wiechert seismograph: 1,000 kilograms.  $A_N$ :  $T_0=6.4$ ,  $\epsilon=2.21$ ,  $\frac{r}{T_0^2}=0.081$ ;  
 $A_E$ :  $T_0=6.5$ ,  $\epsilon=3.79$ ,  $\frac{r}{T_0^2}=0.024$ . Alluvium. 2.40 meters above sea level.]  $T_0^2$

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
293	2	Iv	eP	h. m. s.				Benguet (W of Luzon).
			L	8 31 11				
			M <sub>E</sub>	31 45				
			M <sub>N</sub>	32 06	1		115	
			F	32 14	2	162		
294	2	I	e	39				
			F	19 09 32				
				32				
295	3	Ir	e	20 57 54				
			L	21 07 23				
			M <sub>E</sub>	08 45	6		83	
			M <sub>N</sub>	09 14	5-6	77		
			F	38				
296	4	II	eP	10 44 12				
			L	44 36				
			M <sub>N</sub>	45 43	5	382		
			F	55				
297	4	IIIv	eP	11 46 13				Benguet (W of Luzon).—Maximum and end lost by the pens thrown off through of the force of shock.
			L	46 38				
298	4	IIv	eP	11 58 26				Benguet (W of Luzon). Taken from Vicentini.
			L	58 47				
			F	12 07				
299	4	Iv	eP	15 00 58				Near eastern coast of Samar.
			L	01 50				
			M <sub>E</sub>	02 49	2-3		146	
			F	09				
300	4	I	eP	15 33 24				
			F	44				
301	5	Iv	eP	14 15 36				Benguet (W of Luzon).
			F	18				
302	5	Iv	eP	14 52 08				Benguet (W of Luzon).
			F	56				
303	5	Iv	eP	15 53 18				Benguet (W of Luzon).
			F	57				
304	5	IIv	eP	19 51 33				Benguet (W of Luzon).
			L	51 57				
			F	59				
305	5	Iv	eP	23 29 25				Benguet (W of Luzon).
			F	33				
306	6	Iv	eP	11 10 23				Benguet (W of Luzon).
			F	13				
307	6	Iv	eP	19 10 10				Benguet (W of Luzon).
			F	12				
308	7	I	e	10 27 12				
			F	31				
309	7	Iv	eP	16 03 43				Benguet (W of Luzon).
			F	07				
310	7	Iv	eP	21 11 11				Benguet (W of Luzon).
			F	14				
311	8	Iv	eP	8 37 41				Benguet (W of Luzon).
			F	41				
312	9	Iv	eP	10 07 20				Benguet (W of Luzon).
			F	09				
313	9	Iv	eP	11 20 43				Benguet (W of Luzon).
			F	24				
314	9	Iv	eP	19 07 52				Benguet (W of Luzon).
			F	11				
315	11	Id	eP	21 08 41				
			L	09 02				
			F	12				

## Records of the microseismograph—Continued.

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						A <sub>N</sub> μ	A <sub>E</sub> μ	
316	13	I <sub>r</sub>	e eS eL M <sub>N</sub> M <sub>E</sub> F	<i>h. m. s.</i> 2 06 32 10 26 13 47 15 47 15 52 43	8 8	47 59	Benguet (W of Luzon).	
317	14	I <sub>v</sub>	eP L F	1 15 18 15 54 25				
318	19	I <sub>d</sub>	eP L M <sub>E</sub> M <sub>N</sub> F	14 57 09 57 29 57 33 57 42 15 02	1 3	56 85		
319	19	I <sub>d</sub>	iP F	17 42 44 44				
320	20	I <sub>d</sub>	eP L F	3 27 15 27 28 31				
321	22	I	eP M <sub>N</sub> M <sub>E</sub> F	16 54 54 57 36 58 11 17 10	3-4 5-6	50 46		
322	24	II <sub>v</sub>	eP L M <sub>N</sub>	1 31 40 32 08 33 38	5-6	794		
323	24	I <sub>d</sub>	eP L M <sub>N</sub> F	1 39 06 39 33 39 46 57	4	353		
324	24	I	e F	2 53 45 3 02				
325	24	I <sub>d</sub>	eP L F	15 17 51 18 09 20				
326	25	I	e F	15 10 21 33				
327	26	I	e F	7 46 8 17				
328	29	I <sub>v</sub>	eP F	7 05 09 24			Off northeast coast of Mindanao.	

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

4, 15<sup>h</sup> 00<sup>m</sup> 58<sup>s</sup> \* [4, 23<sup>h</sup> 00<sup>m</sup> 58<sup>s</sup>]. Sámar, Leyte, SE de Luzón y NE de Mindanao. Temblor de tierra de intensidad V; su origen se hallaba en el Pacífico frente a las costas orientales de Sámar, sin duda en la gran Fosa de Filipinas. En la parte E de Sámar fué acompañado de ruido subterráneo, pero su intensidad máxima no pasó del grado V: sintióse en el resto de esta isla, en la de Leyte y en el extremo SE de Luzón. Al NE de Mindanao, en la cuasipenínsula de Surigao, su intensidad sería de IV a V, pues despertó a varias personas dormidas; fué perceptible también en la parte N del Valle del Agusan, que dista unos 80 kilómetros de las costas del Pacífico. No nos consta si fué perceptible más hacia el S en las costas del E y SE de Mindanao; de todos modos la zona en que de cierto lo fué se extendía sobre 500 kilómetros en la dirección N-S, y más de 100 de E-W. Con haber sido tanta la extensión de este terremoto, pues el área indicada representa solamente una sección de la parte W del área total, su intensidad fué realmente desproporcionada, aún suponiéndola mucho mayor en el epicentro de lo que fué a 50 kilómetros de distancia, en las citadas costas de Sámar y Mindanao. Que la intensidad en el epicentro no fué mucha lo prueban los registros de los seismógrafos de Manila y la limitada propagación de las ondas sísmicas, pues solamente registraron este terremoto los seismógrafos de Manila y Baguio, pero no los de fuera del Archipiélago.

15, 12<sup>h</sup> 5<sup>m</sup> [15, 20<sup>h</sup> 5<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección ESE-WNW, intensidad III-IV, duración 5<sup>s</sup>.

24, 1<sup>h</sup> 31<sup>m</sup> 40<sup>s</sup> \* [24, 9<sup>h</sup> 31<sup>m</sup> 40<sup>s</sup>]. W de Luzón. Temblor de tierra de intensidad III sentido en la parte N de Zambales. Su origen se hallaba en el mar de la China a corta distancia de la costa occidental de Luzón. A 1<sup>h</sup> 39<sup>m</sup> los seismógrafos del Observatorio registraron una repetición que no parece fuese perceptible dentro de la isla.

29, 7<sup>h</sup> 05<sup>m</sup> 9<sup>s</sup> \* [29, 15<sup>h</sup> 05<sup>m</sup> 9<sup>s</sup>]. E de Sámar y NE de Mindanao. Temblor oscilatorio de intensidad IV-V. Su origen probablemente se hallaba en la Fosa de Filipinas pero algo más al S, que el del día 4. A lo largo de las costas orientales de la Isla de Sámar tuvo intensidad III y en la parte NE de Mindanao, donde fué de muy larga duración, llegó a intensidad IV-V. Nuestro observador de Butuan, notó primeramente movimientos ondulatorios muy débiles durante unos 15 segundos, éstos aumentaron en intensidad pero sin perder su carácter ondulatorio, por espacio de 25 segundos, volviendo luego a disminuir; de manera que la duración total, cree se acercó a un minuto: la dirección de los movimientos fué constante del E y ENE próximamente. Es de suponer, aunque no nos consta, que se sintió en las costas del E de Mindanao y tal vez en la parte S del Valle del Agusan. No parece haber sido registrado por los seismógrafos de fuera del Archipiélago pero si por los de Manila y Baguio. Este temblor por consiguiente revistió un carácter semejante al del día 4; grande extensión, poca intensidad, y propagación muy limitada de las ondas sísmicas del grado I de la escala Rossi-Forel, no perceptibles a los sentidos.<sup>2</sup>

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.

<sup>2</sup> De los temblores de tierra sentidos este mes en Benguet se trató en el Boletín de Agosto.







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## BULLETIN FOR OCTOBER, 1913.



# METEOROLOGICAL BULLETIN FOR OCTOBER, 1913.

By Rev. JOSÉ CORONAS, S. J.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

Pressure and temperature.—The mean atmospheric pressure of the month was slightly greater than during October of last year in practically all the stations of the Philippines. In Manila it differed from the normal by  $-0.14$  mm., but was greater than the mean of October, 1912, by  $0.15$  mm. The maximum pressure was registered in Mindanao, the Visayas, and the S. of Luzon on the 25th, and in the central and northern Luzon on the 28th or 29th. The lowest pressures were recorded on the 11 to 14.

PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR OCTOBER, 1913.

Station.	Pressure.					Temperature.						
	Mean.	Departure from Oct., 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from Oct., 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		°C.	°C.	°C.		°C.	
Tagbilaran	758.62	+0.62?	760.35	25	755.50	11	26	-1.1?	33.3	30	21.5	6
Surigao	58.40	+	60.38	25	55.21	11	27		33.9	14	22.8	29
Cebu	58.57	+	60.27	25	54.92	11	26.9	0	32	1, 9, 28	22.2	4
Iloilo	58.37	+	60.31	25	54.76	12	26.5	0	31	1, 2, 28	21.1	27
Ormoc	58.67	+	60.54	25	55.07	11	26.2	-.2	32.2	30	19.8	27
Tacloban	58.26	+	60.45	25	54.41	11	26.7	-.3	33.6	8	21.4	27
Capiz	58.52	+	60.82	25	54.47	13	26.1	-.4	33.8	2	21.6	28
Calbayog	58.19	+	60.53	25	53.78	12	26.3	-.3	32.9	22, 23	19.7	26
Legaspi	57.92	—	60.67	25	51.40	11	26.4	-.5	34.2	7, 8	18.4	26
Atimonan	58.32	+	61.12	25	51.83	13	26.2	-.4	32.2	15	20.3	26
Ambulong, Tanauan	58.03		60.54	25	51.83	13	26.3		35.1	2	18.6	26
Paracale	58.36	+	61.41	25	51.42	13	26.1	-.7	32	2, 7	19.5	26
Manila	58.51	+	61.13	29	51.87	13	26.1	-.2	33.5	2	19.5	26
San Isidro	58.57	+	61.38	29	51.66	13	<sup>a</sup> 26.2	0	<sup>a</sup> 34	2	<sup>a</sup> 19.3	27
Dagupan	57.76	—	60.61	29	50.68	13, 14	27.2	+.2	35	2	20.2	27
Bolinao	58.06	+	60.90	29	50.82	13	27.3	+.5	33.7	9	20.6	26
Baguio <sup>b</sup>	636.14	+	638.30	29	630.19	14	17.6	-.4	25.3	31	11.3	26
Vigan	758.10	+	760.96	29	750.89	13	26.6	-.1	33.5	3	19.8	27
Tuguegarao	59.03	+	62.46	29	50.02	14	25.1	-.4	35.1	1	19	25
Aparri	59.16	+	62.68	28	50.41	14	25.6	-.4	32	3	20.6	17, 25, 26

<sup>a</sup> 30 days of observation.

<sup>b</sup> The barometric readings of this station are not reduced to sea level.

The mean monthly temperature differed but slightly from that of October 1912. The extreme values for Manila were  $33.5^{\circ}\text{C.}$  on the 2d, and  $19.5^{\circ}\text{C.}$  on the 26th.

Rainfall.—The greater number of the meteorological stations in the Philippines registered less rain than in October of last year, and many of them had less than the normal of the month. In Manila there was 119.7 mm. of rain, which is 67.5 mm. less than the normal for the month, and 50.7 mm. less than during October 1912.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF OCTOBER, 1913.

Station.	Total.	Departure from October, 1912.	Departure from normal.	Rainy days.	Departure from October, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from October, 1912.	Departure from normal.	Rainy days.	Departure from October, 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.		mm.				mm.	mm.	mm.		mm.		
Jolo	160.1	-94.6	-51	18	-1	50.8	21	Calapan	362.1	+34	18	-2	154.9	27	
Isabela, Basilan	280.3	-88.7	-15	-2	90.7	21		Virac	389.4	+4.2	28	+4	122.9	11	
Zamboanga	155.2	-40.8	12	-	25.4	15		Nueva Caceres	639.3	+202.3	22	0	302.2	11	
Davao	163.9	-64.7	+77.8	11	-6	28.4	3	Batangas	207.8	-151.3	17	3	44.4	14	
Cotabato	340.2	+25.2	+85.1	18	+3	78.8	31	Atimonan	364	-183.9	-13.6	21	+2	69.9	11
Cagayan, Misamis	294.6	+79	19	+3	81.6	10		Ambulong, Tanauan	187.5	-94.4	13	5	66.8	14	
Dapitan	355.3	+14.5	-27.1	15	+2	75.7	24	Silang	102.3	-219	23	-5	56.9	14	
Butuan	135.8	+89.3	15	+4	43.9	20		Paracale	782.9	-41.8	12	-12	177.3	12	
Dumaguete	227	+115.2	15	+2	69.1	12		Sta. Cruz, Laguna	227.7	-50.7	13	-13	71.1	12	
Yap, W. Carolines	372.3	+52.2	21	+1	49.2	25		Manila	119.7	-67.5	13	-13	48.5	14	
Tagbilaran	383.3	+102.3	11	-	166.2	12		Antipolo	229.4	-27.7	17	-7	68.8	14	
Surigao	200	-202	-38.4	18	-2	53.8	20	Iba	107.5	-317.8	13	-9	44.4	13	
Maasin	312.7	-482.7	+77.1	13	+3	40.4	20	San Isidro	177.5	-31.3	13	-3	52.6	12	
Cebu	318.1	-270.2	+102.2	21	-3	79.7	9	Tarlac	114.3	-75.9	-77.1	12	-4	24.4	18
Iloilo	381.9	-177.6	+123.3	18	+1	101.7	12	Baler	260.5	-167.8	20	+1	42.4	18	
San Jose Buenavista	360	-361.8	14	0	52.8	10		Dagupan	112.1	-120	-86.7	8	-8	67.2	13
Cuyo	247.6	-56.7	21	-6	66.3	12		Bolinao	67.3	-206.3	-117.7	7	-9	36.8	19
Ormoc	335.7	-147.8	+78.2	22	-4	164.4	11	Baguio	139.2	-302.7	-317.5	21	-4	37	5
Tacloban	252.8	-59.5	19	0	62.3	11		San Fernando, Union	44	-221.3	-96.9	5	-10	14.5	3
Capiz	187.1	-302.1	-320.6	21	+1	48	19	Echague	148.5	-193.9	18	-7	29.5	13	
Borongan	288.2	13.9	-52.2	18	0	59.5	31	Candon	29.3	-124.8	6	-10	13.7	18	
Calbayog	220.1	-155.3	-35.4	20	0	45.7	17	Vigan	45.6	-326.7	-122.2	5	-9	12.5	14
Masbate	179.3	-79.2	17	-5	62.2	12		Tuguegarao	301.7	-82.9	+36.2	13	-6	114.4	13
Romblon	402	-87.9	23	-2	56.4	13		Laog	73.2	-200.5	4	-10	44	13	
Batag	374.6	-18	18	78.2	19			Aparri	521.7	+231.8	+222.5	17	-5	130	14
Gubat	323.3	+3.9	20	+1	49.8	19		Sto. Domingo, Bata-	268.8	-201	17	-3	53.8	12	
Legaspi	495.4	+162.8	+151.4	16	-4	227.1	11	nes							
Sumay, Guam	344.5	-35.5	21	+1	47	9									

## DEPRESSIONS AND TYPHOONS.

Although not a single depression or typhoon crossed the Islands during the month, nevertheless the Observatory had occasion to announce five typhoons all of which formed in the Pacific and recurved to the NE. See the tracks in Plate XIV.

Typhoon of September 30 to October 4, 1913.—The observations made in Guam and Yap on the 28, 29 and 30th seem to indicate the existence of this typhoon to the W of the Mariana or Ladrone Islands in 15° lat. N and close to 139° long. E.

The following note was published on the morning of October 1:

October 1, 11.25 a. m.: There seems to be a far-distant depression or typhoon over the Pacific to the W of the northern Ladrone Islands, moving NW or NNW.

The typhoon actually moved to the NNW till it recurved to the NE on the night of the 2d between 27° and 31° lat. N. During the night of the 3d, it crossed the southeastern part of Japan to the N of Tokio and entered the Pacific again on the 4th travelling NE.

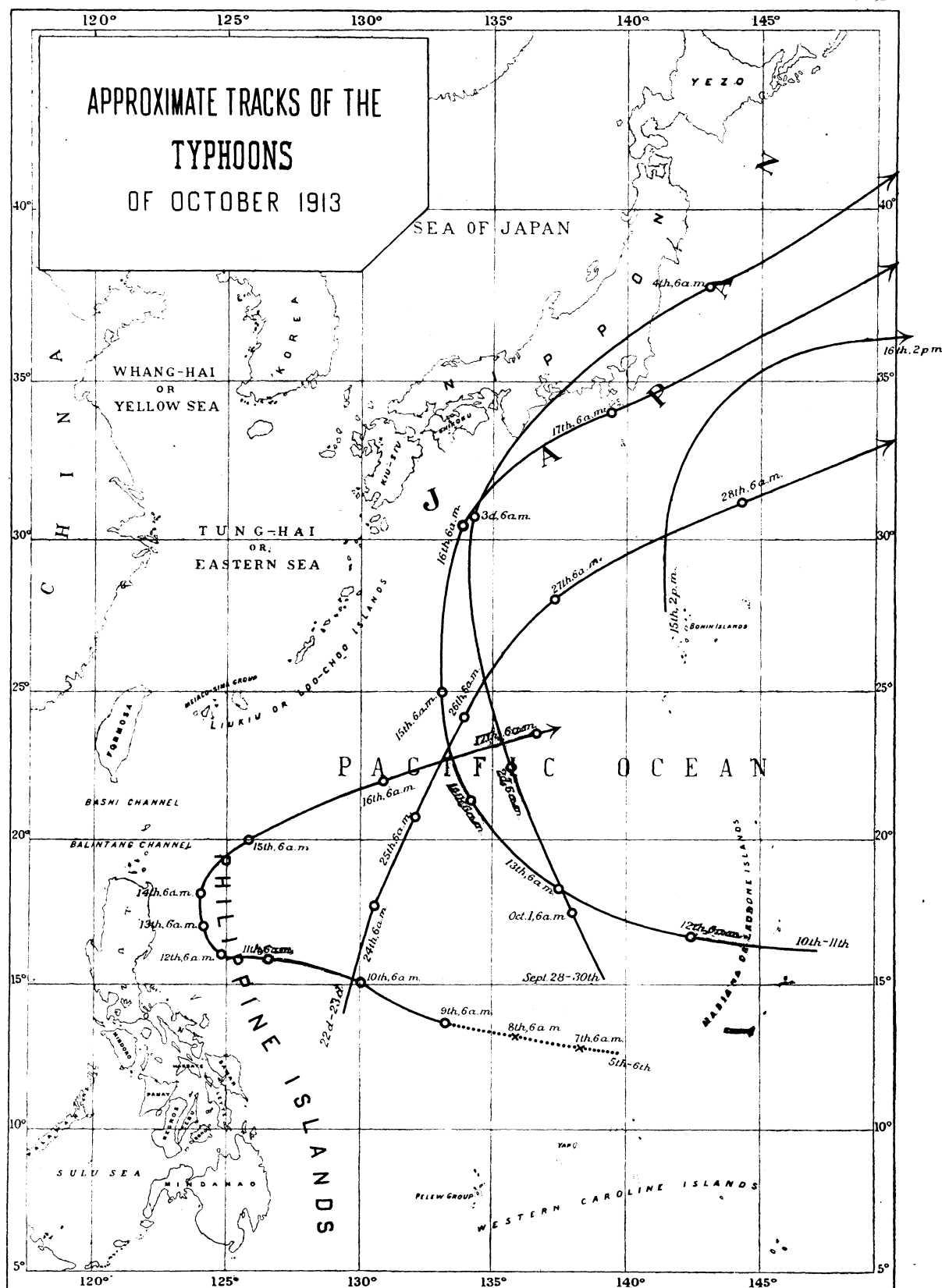
These warnings were sent to the meteorological centers of the Far East:

October 2, 3.10 p. m.: Typhoon over the Pacific Ocean, about halfway between the Mariana Islands and the Loochoos, moving NW.

October 3, 11.25 a. m.: Typhoon NE of Naha, moving N.

Three simultaneous typhoons in the Pacific, October 9-17, 1913.—As may be seen from the tracks of these three typhoons given in Plate XIV, two of them were simultaneously in existence from the 10th to the 16th or 17th, while the third appeared for the first time in our weather map on the 15th. Only one of these storms had any influence on the Philippines, viz, the one which recurved to the NE when its vortex was only about 100 miles from the E coast of northern Luzon. The other two typhoons recurved further away from the Islands.

The first of the storms appears to have been in process of formation from the 5th to the 8th to the N and NW of Yap, at the same time that it was slowly advancing



to the W. As is indicated on Plate XIV, only a probable value can be given to this first part of the track. On the 9th it had already begun to have a marked influence on the eastern part of the Philippines, and as it moved till the night of the 11th very much inclined to the W, there was real danger for the Island of Luzon.

The following warnings were sent out by the Observatory:

October 9, 3.40 p. m.: There are signs of a depression or typhoon over the Pacific to the E of southern Luzon. Its actual direction cannot yet be ascertained.

October 10, 11.20 a. m.: The typhoon was situated at 6 o'clock this morning to the E of Luzon in about 15° lat. N and 130° long. E, moving apparently WNW.

October 11, 9.15 a. m.: The typhoon was situated this morning at 6 o'clock in about 16° lat. N and 127° long E, moving WNW.

The slowness with which this typhoon moved from the afternoon of the 11th to the morning of the 12th gave the suspicion that it would recurve to the N and hence have but little influence on the Islands, as actually happened. These notes were published in the Manila papers:

October 12, 11.30 a. m.: The typhoon in the Pacific to the E of Luzon was at 6 o'clock this morning to the ENE of Manila close to 125° long. E. It has remained almost stationary since yesterday afternoon and will probably either recurve to the N, or gradually fill up.

October 12, 4.45 p. m.: The typhoon was at 2 o'clock this afternoon to the E of the central part of Luzon some 150 miles distant, probably moving to the N. Hence it does not seem to be dangerous for Luzon.

From 2 p. m. of the 11th till 2 p. m. of the 14th, the typhoon was recurving and at the same time was advancing so slowly that the velocity of translation did not reach 3 miles an hour. On the 15th the vortex was to the E of the Balintang Channel, while the velocity of translation increased and the typhoon moved to the ENE, till it probably filled up on the 17th to the SW of the Bonin Islands.

The following are the notes and warnings of this typhoon sent out by the Observatory:

October 13, 9.30 a. m.: The typhoon was situated at 6 o'clock this morning to the E of northern Luzon near 124° longitude E and between 16° and 18° latitude N, moving slowly NNW or N.

October 14, 9.30 a. m.: The typhoon has been moving very slowly since yesterday. It was situated at 6 o'clock this morning to the E of Cagayan Province near 18° latitude N and between 123° and 124° longitude E, and continues moving northward.

October 14, 4.40 p. m.: The typhoon is situated this afternoon to the East of Aparri recurving northeastward.

October 15, 11.50 a. m.: The typhoon of the Pacific has recurved northeastward, its center being situated this morning to the E of the Balintang Channel, moving NE.

October 16, 11.30 a. m.: The typhoon situated yesterday to the E of the Balintang Channel seemed to lie at 6 o'clock this morning in about 131° longitude E and between 21° and 22° latitude N, moving ENE.

The following telegrams were exchanged between Hongkong and Manila:

FROM MANILA.

October 9, 3.40 p. m.: Typhoon E of southern Luzon, direction unknown.

October 10, 11.20 a. m.: Typhoon E of Luzon, more than 300 miles distant, moving WNW.

October 11, 9.15 a. m.: Typhoon E of Luzon, less than 300 miles distant, moving WNW.

October 12, 9.40 a. m.: Typhoon E of Luzon, less than 300 miles distant, almost stationary.

October 12, 4.40 p. m.: Typhoon E of Luzon, less than 300 miles distant, inclining northward.

October 13, 9.30 a. m.: Typhoon E of northern Luzon, less than 300 miles distant, moving NNW or N.

October 13, 9.58 p. m.: Typhoon in about 124° longitude E and 17° latitude N, moving N.

October 14, 4.40 p. m.: Typhoon E of Aparri, less 300 miles distant, recurving northeastward.

October 15, 12.20 p. m.: Typhoon E of Balintang Channel, moving NE.



## FROM HONGKONG.

October 10, 10.45 a. m.: Typhoon E of Luzon, moving W.  
October 11, 10.55 a. m.: Typhoon E of Manila, moving WNW.  
October 12, 11.55 a. m.: Typhoon E of Manila, stationary.  
October 12, 5.50 p. m.: Typhoon E of Manila, moving N.  
October 14, 9.00 a. m.: Typhoon NE of Manila, moving NNW.  
October 15, 11.30 a. m.: Typhoon E of Balintang Channel, moving NE.

The observatory of Zikawei sent the following warnings to the stations along the China coast.

October 9, 9 p. m.: Typhoon far E of the Philippines, direction WNW.  
October 10, 9 p. m.: Typhoon far E of the Philippines, direction WNW.  
October 11, noon.: Typhoon E of Luzon, direction WNW.  
October 11, 9 p. m.: Typhoon SE of Luzon, direction NW.  
October 12, 9 p. m.: Typhoon E of Luzon, recurving.  
October 13, noon.: Typhoon E of Luzon, direction N.  
October 13, 9 p. m.: Typhoon center of Luzon, direction NW.  
October 14, 9 p. m.: Typhoon NE of Luzon, recurving.

While this typhoon was approaching the Philippines the observations from Guam gave indications of the formation of another to the NE of that station and not far from the Mariana Islands. On the 11th the new typhoon passed at its least distance from the N of Guam, moving W. On the 12th it began to incline slightly to the N, on the 13th more definitely, so that on the 14th and 15th it moved exactly northwards and finished the recurve to NE on the 16th in the neighbourhood of  $30^{\circ}$  or  $31^{\circ}$  lat. N.

The observatory followed the track of this typhoon by means of these typhoon warnings sent to the observatories of the Far East:

October 11, 9.15 a. m.: Typhoon near or over the southern Ladrone or Mariana Islands, moving W or WNW.  
October 12, 9.40 a. m.: Typhoon W of the Ladrone or Mariana Islands, moving W or WNW.  
October 13, 9.58 p. m.: Typhoon over the Pacific Ocean, about halfway between the Mariana Islands and the Loochoos, inclining northward.  
October 14, 4.40 p. m.: Typhoon ESE of Naha, moving NNW or N.  
October 15, 12.20 p. m.: Typhoon E of Naha, moving N.

The complete recurve to the NE was indicated in the ordinary weather note of the 16:

October 16, 11.30 a. m.: The typhoon of the Mariana Islands seems to be situated at present to the E of the northern Loochoos, recurving northeastward.

In the 2 p. m. map of the 15th when the first of the two above-mentioned typhoons was to the E of the Balintang Channel between  $20^{\circ}$  and  $21^{\circ}$  lat. N and  $127^{\circ}$  and  $129^{\circ}$  long. E, and the second to the E of the Loochoos between  $25^{\circ}$  and  $28^{\circ}$  lat. N and  $132^{\circ}$  and  $134^{\circ}$  long. E, another well-developed cyclonic center suddenly appeared close to the Bonins, but whence it came or when it was formed, it was impossible to say. From the Bonins it moved to the N and NE.

Mention was made of this typhoon in the ordinary weather note of the 16th:

October 16, 11.30 a. m.: Another typhoon appeared yesterday close to the Bonin Islands, its center being situated at 6 o'clock this morning to the SE of Tokio, moving northeastward.

**Depression or typhoon of October 22 to 28, 1913.**—Since the afternoon of the 22d there were indications of a depression or typhoon in the Pacific to the E of the central part of the Philippines, but it was soon seen that the storm was recurving to the NE and not approaching the Islands. During the night of the 26th the vortex passed between the Bonins and the Loochoos, and on the night of the 27th between the Bonins and Japan.

These notes were published with regard to this typhoon:

October 23, 11.45 a. m.: There are signs of a distant depression or typhoon over the Pacific to the E of southern Luzon. Its actual direction cannot yet be ascertained, although it seems probable that it will move northward.

October 23, 4.25 p. m.: The depression or typhoon mentioned in this morning's weather note is not dangerous for the Philippines as it seems to be recurving northeastward.

October 24, 11.20 a. m.: The typhoon seems to have recurved northeastward to the E of Luzon.

October 27, 11.20 a. m.: That the typhoon announced last Thursday as recurving northeastward has really moved in that direction, is being fully confirmed by the observations received from Japan yesterday and this morning. Its center was situated at 6 o'clock this morning to the W of the Bonin Islands moving northeastward.

The following telegrams were transmitted to the observatories of the Far East:

October 22, 4.00 p. m.: Typhoon E of southern Luzon, direction unknown.

October 23, 4.25 p. m.: Typhoon E of southern Luzon, recurving northeastward.

## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes es para casi todas las estaciones de Filipinas algo mayor que la de Octubre del año pasado. La de Manila difiere de la normal en  $-0.14$  mm., pero supera a la media mensual de Octubre de 1912, en  $0.15$  mm. Las presiones mayores se observaron el 25 en Mindanao, las Visayas y S de Luzón, y el 28 ó 29 en el centro y norte de Luzón. Las presiones más bajas se registraron del 11 al 14.

La temperatura media mensual se diferencia muy poco de la de Octubre de 1912. Los valores extremos para Manila fueron  $33.5$  y  $19.5^{\circ}$  C. registrados respectivamente los días 2 y 26.

**Precipitación acuosa.**—Una gran mayoría de las estaciones de Filipinas dan este mes un total de lluvia menor que el año pasado. También son más en número, aunque no de una manera tan notable, las estaciones que aparecen con una lluvia mensual inferior a la normal de este mes. En los pluviómetros de Manila se recogieron en todo el mes  $119.7$  mm. de agua, cantidad que difiere en  $-67.5$  mm. de la normal de Octubre, y en  $-50.7$  mm. de la lluvia de Octubre del año pasado.

## DEPRESIONES Y TIFONES.

Aunque ni una sola depresión o tifón atravesó las Filipinas durante este mes, sin embargo el Observatorio anunció en sus notas del tiempo o avisos de tifón cinco tifones, los cuales se formaron en el Pacífico y recurvaron todos al NE. Véanse sus trayectorias en la lámina XIV.

**Tifón de 30 de Septiembre a 4 de Octubre de 1913.**—Las observaciones hechas en Guam y Yap los días 28, 29 y 30 parecen indicar la formación de este tifón al W de las Islas Ladrones o Marianas y a igual distancia de ambas estaciones, en los alrededores de  $15^{\circ}$  latitud N y cerca de  $139^{\circ}$  longitud E.

El Observatorio anunció la existencia y dirección de este tifón por medio de la siguiente nota dada la mañana del 1 de Octubre:

Octubre 1, 11.25 a. m.: Parece existir una depresión o tifón distante en el Pacífico al W de la parte norte de las Islas Ladrones o Marianas, moviéndose al NW o NNW.

De hecho se movió este tifón al NNW hasta que recurvó al NE la noche del 2 al 3 entre los paralelos  $27^{\circ}$  y  $31^{\circ}$  N. Durante la noche del 3 al 4 atravesó la parte sudeste de Japón por el N de Tokio internándose de nuevo el día 4 en el Pacífico en dirección al NE.

El Observatorio de Manila envió estos dos avisos de tifón a los centros meteorológicos del Extremo Oriente:

Octubre 2, 3.10 p. m.: Tifón en el Océano Pacífico, a la mitad de camino entre las Islas Marianas y Liukiu, moviéndose al NW.

Octubre 3, 11.25 a. m.: Tifón al NE de Naha (Islas Liukiu), moviéndose al N.

**Tres tifones simultáneos en el Pacífico, 9 a 17 de Octubre de 1913.**—Como puede verse en las trayectorias que damos de estos tres tifones en la lámina XIV, dos de ellos existieron simultáneamente del 10 al 16 ó 17, y el otro existió también simultáneamente con estos dos cuando menos los días 15 y 16. Puede decirse que sólo uno de ellos influyó en las Filipinas por haber recurvado al NE cuando se hallaba el vórtice a unas 100 millas solamente de la costa oriental del norte de Luzón. Los otros dos verificaron la recurva muy lejos del Archipiélago.

El primero de estos tifones parece que se hallaba en vías de formación del 5 al 8 hacia el N y NW de Yap al propio tiempo que iba avanzando lentamente hacia el W. Como se indica en la lámina XIV, solamente podemos dar un valor algo probable a esta

primera parte de la trayectoria de este baguio. El día 9 empezó ya a influir de una manera bien definida en la parte oriental de nuestro Archipiélago. Hasta la noche del 11 al 12 se movió muy inclinado al W, presentando verdadero peligro para la Isla de Luzón. Véanse a continuación los avisos dados por el Observatorio los días 9, 10 y 11:

Octubre 9, 3.40 p. m.: Hay indicios de una depresión o tifón en el Pacífico al E de la parte sur de Luzón. No se puede aún precisar su actual dirección.

Octubre 10, 11.20 a. m.: El tifón se hallaba a las 6 de esta mañana al E de Luzón en los alrededores de 15° latitud N y 130° longitud E moviéndose aparentemente al WNW.

Octubre 11, 9.15 a. m.: El tifón se hallaba a las 6 de esta mañana en los alrededores de 16° latitud N y 127° longitud E moviéndose al WNW.

La notable lentitud con que se movió este tifón desde la tarde del 11 hasta la madrugada del 12 nos hizo sospechar ya que se inclinaría al N y dejaría de ser peligroso para Filipinas como así fué en realidad. Así lo indicó el Observatorio en las siguientes notas publicadas el día 12 en los periódicos de Manila:

Octubre 12, 11.30 a. m.: El tifón del Pacífico al E de Luzón se hallaba a las 6 de esta mañana al ENE de Manila cerca de 125° longitud E. Ha permanecido casi estacionario desde ayer tarde y probablemente o se inclinará al N o se irá deshaciendo gradualmente.

Octubre 12, 4.45 p. m.: El tifón se hallaba a las 2 de esta tarde al E de la parte central de Luzón, a la distancia de unas 150 millas, moviéndose probablemente hacia el N. De ahí que no parece ser peligroso para Luzón.

Por espacio de unos tres días, es decir, desde 2 p. m. del 11 hasta 2 p. m. del 14, estuvo este baguio verificando su recurva al N y NE al propio tiempo que iba avanzando con una lentitud sumamente extraordinaria. Su velocidad de traslación durante estos tres días no llegaba a 3 millas por hora. El día 15 demoraba el vórtice al E del Canal de Balintang aumentando en velocidad y moviéndose al ENE. Probablemente se deshizo este tifón el día 17 cuando se hallaba al SW de las Islas Bonin.

El Observatorio de Manila fué siguiendo y anunciando estos cambios de dirección de este baguio por medio de las siguientes notas o avisos de tifón:

Octubre 13, 9.30 a. m.: El tifón se hallaba las 6 de esta mañana al E del norte de Luzón, cerca de 124° longitud E y entre 16° y 18° latitud N, moviéndose al NNW o N.

Octubre 14, 9.30 a. m.: El tifón se ha estado moviendo muy despacio desde ayer. Se hallaba a las 6 de esta mañana al E de la Provincia de Cagayán cerca de 18° latitud N y entre 123° y 124° longitud E y continúa moviéndose al N.

Octubre 14, 4.40 p. m.: El tifón se halla esta tarde al E de Aparri recurvando al NE.

Octubre 15, 11.50 a. m.: El tifón del Pacífico ha recurvado al NE, hallándose su centro esta mañana al E del canal de Balintang, moviéndose al NE.

Octubre 16, 11.30 a. m.: El tifón situado ayer al E del canal de Balintang parecía hallarse a las 6 de esta mañana en los alrededores de 131° longitud E y entre 21° y 22° latitud N moviéndose al ENE.

Los siguientes telegramas se cruzaron durante este tifón entre los Observatorios de Manila y Hongkong:

#### MANILA.

Octubre 9, 3.40 p. m.: Tifón al E de la parte sur de Luzón, dirección desconocida.

Octubre 10, 11.20 a. m.: Tifón al E de Luzón, distancia mayor de 300 millas, moviéndose al WNW.

Octubre 11, 9.15 a. m.: Tifón al E de Luzón, distancia menor de 300 millas, moviéndose al WNW.

Octubre 12, 9.40 a. m.: Tifón al E de Luzón, distancia menor de 300 millas, casi estacionario.

Octubre 12, 4.40 p. m.: Tifón al E de Luzón, distancia menor de 300 millas, inclinándose al N.

Octubre 13, 9.30 a. m.: Tifón al E de la parte norte de Luzón, distancia menor de 300 millas, moviéndose al NNW o N.

Octubre 13, 9.58 p. m.: Tifón en los alrededores de 124° longitud E y 17° latitud N, moviéndose al N.

Octubre 14, 4.40 p. m.: Tifón al E de Aparri, distancia menor de 300 millas, recurvando al NE.

Octubre 15, 12.20 p. m.: Tifón al E del canal de Balintang, moviéndose al NE.

## HONGKONG.

Octubre 10, 10.45 a. m.: Tifón al E de Luzón, moviéndose al W.  
Octubre 11, 10.55 a. m.: Tifón al E de Manila, moviéndose al WNW.  
Octubre 12, 11.55 a. m.: Tifón al E de Manila, estacionario.  
Octubre 12, 5.50 p. m.: Tifón al E de Manila, moviéndose al N.  
Octubre 14, 9.00 a. m.: Tifón al NE de Manila, moviéndose al NNW.  
Octubre 15, 11.30 a. m.: Tifón al E del canal de Balintang moviéndose al NE.

El observatorio de Zikawei transmitió los siguientes avisos de tifón a las estaciones de la costa de China:

Octubre 9, 9 p. m.: Tifón lejos al E de Filipinas, moviéndose al WNW.  
Octubre 10, 9 p. m.: Tifón lejos al E de Filipinas, moviéndose al WNW.  
Octubre 11, 12 mediodía: Tifón al E de Luzón, dirección WNW.  
Octubre 11, 9 p. m.: Tifón al SE de Luzón, dirección NW.  
Octubre 12, 9 p. m.: Tifón al E de Luzón, recurvando.  
Octubre 13, 12 mediodía: Tifón al E de Luzón, dirección N.  
Octubre 13, 9 p. m.: Tifón en el centro de Luzón, dirección NW.  
Octubre 14, 9 p. m.: Tifón al NE de Luzón, recurvando.

Mientras este tifón se acercaba a Filipinas, las observaciones de Guam indicaban la formación de otro al NE de aquella estación no lejos de las Islas Ladroneas o Marianas. El día 11 pasaba el nuevo tifón a la menor distancia por el N de Guam en dirección al W. El día 12 empezó a inclinarse ligeramente al N, aumentó esta inclinación el día 13, se movió casi exactamente al N los días 14 y 15, y terminó su recurva al NE el día 16 en los alrededores del paralelo 30° ó 31° N.

El Observatorio de Manila fué siguiendo la trayectoria de este tifón por medio de estos avisos de tifón transmitidos a los observatorios centrales del Extremo Oriente:

Octubre 11, 9.15 a. m.: Tifón en o cerca de la parte sur de las Islas Ladroneas o Marianas, moviéndose al W o WNW.  
Octubre 12, 9.40 a. m.: Tifón al W de las Islas Ladroneas o Marianas, moviéndose al W o WNW.  
Octubre 13, 9.58 p. m.: Tifón en el Océano Pacífico, a la mitad de camino entre las Islas Marianas y Liukiu, inclinándose al N.  
Octubre 14, 4.40 p. m.: Tifón al ESE de Naha, moviéndose al NNW o N.  
Octubre 15, 12.20 p. m.: Tifón al E de Naha, moviéndose al N.

La completa recurva al NE fué indicada en la nota ordinaria del tiempo del día 16 en estos términos:

Octubre 16, 11.30 a. m.: El tifón procedente de las Islas Marianas parece hallarse al presente al E de la parte septentrional de las Islas Liukiu, recurvando al NE.

En el mapa de 2 p. m. del día 15, cuando los dos tifones de que acabamos de hablar se hallaban, el uno al E del canal de Balintang, entre los paralelos 20° y 21° N y los meridianos 127° y 129° E, y el otro al E de las Islas Liukiu entre los paralelos 25° y 28° N y los meridianos 132° y 134° E, apareció de repente otro centro ciclónico bien desarrollado en los alrededores de las Islas Bonin, sin que nos sea posible precisar dónde ni cuándo se formó. Desde las Islas Bonin se dirigió al N y NE.

El Observatorio de Manila hizo mención de este tifón en la nota ordinaria del tiempo del día 16:

Octubre 16, 11.30 a. m.: Otro tifón apareció ayer cerca de las Islas Bonin, hallándose su centro a las 6 de esta mañana al SE de Tokio, moviéndose al NE.

**Depresión o tifón de 22 a 28 de Octubre de 1913.**—Desde la tarde del 22 había indicios de una depresión o tifón en el Pacífico al E de la parte central de Filipinas, la cual se vió pronto que recurvaría al NE sin acercarse al Archipiélago. Durante la noche del 26 al 27 pasaba el vórtice por entre las Islas Bonin y Liukiu, y la noche del 27 al 28 por entre Bonin y Japón.

**El Observatorio de Manila publicó sobre este tifón las notas siguientes:**

Octubre 23, 11.45 a. m.: Hay indicios de una depresión o tifón distante en el Pacífico al E de la parte sur de Luzón. No se puede aún precisar su actual dirección, si bien es probable que se moverá al N.

Octubre 23, 4.25 p. m.: La depresión o tifón mencionado en la nota de esta mañana no es peligroso para Filipinas, pues parece recurvar al nordeste.

Octubre 24, 11.20 a. m.: El tifón parece haber recurvado al nordeste al E de Luzón.

Octubre 27, 11.20 a. m.: Que el tifón anunciado el jueves como recurvando al nordeste se ha movido realmente en esta dirección, queda plenamente confirmado con las observaciones recibidas de Japón ayer y esta mañana. Su centro se hallaba a las 6 de esta mañana al W de las Islas Bonin moviéndose al NE.

**A los observatorios centrales del Extremo Oriente se transmitieron estos telegramas:**

Octubre 22, 4 p. m.: Tifón al E de la parte sur de Luzón, dirección desconocida.

Octubre 23, 4.25 p. m.: Tifón al E de la parte sur de Luzón, recurvando al nordeste.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Rela- tive humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.			Free expos- ure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.				
1	758.66	27.6	32.9	24	29.5	30.7	30.1	30.3	29.4	29	82.7	22.5	3.3	2.4
2	58.31	27.9	33.5	24.7	30	31.3	30.5	30.6	29.3	29	82.1	22.7	3.9	2.6
3	58.55	26.7	30.9	24.4	30.2	30.5	30.6	30.8	29.3	29.1	87	22.5	2.1	1.7
4	59.04	26.6	32.2	22.3	29.9	30	30.6	30.5	29.4	29	83	21.4	2.3	2
5	58.89	25.9	32.2	22	29.9	29.8	30.2	30.3	29.4	29	83.8	20.8	2.3	1.9
6	58.58	26.4	31.6	23.6	29.3	30	30.1	30.3	29.4	29	86.8	22.1	1.6	1.6
7	59.12	26.5	32.2	22.7	29.1	30.2	30.1	30.1	29.4	29	83.5	21.3	3.4	2.4
8	58.96	26.6	32.4	22.2	29.3	30.2	30.1	30.3	29.4	29	86.5	22.2	2.6	1.9
9	57.53	26.7	32.3	22.7	29.4	30.5	30.1	30.4	29.4	29	84.5	21.9	3.4	2.4
10	56.47	26.8	32.4	23.4	29.4	30.3	30.3	30.5	29.5	29	84.6	21.9	3.2	2.2
11	55.32	25	27.7	23.4	29.3	29.4	30.2	30.1	29.5	29	91.2	21.4	2	1.7
12	53.95	25.3	29.7	22.7	28.5	29.2	29.9	29.9	29.5	28.9	88.6	21.1	1.2	1.9
13	51.87	25.5	28.5	23	28.5	28.5	29.6	29.6	29.5	29	91.6	22.2	1.5	1.5
14	52.36	25.4	27.7	24.5	28	27.6	29.2	28.9	29.5	28.9	93.3	22.4	1	1.7
15	55.14	27.2	32.2	23.2	28.3	28.5	28.8	28.8	29.6	29	84.2	22.8	3.6	2.6
16	58.05	27.2	32	24	28.3	29	28.9	29.1	29.5	29	81.7	21.8	3.9	3
17	59.22	26	31	23	28.3	29.5	29.1	29.3	29.4	28.9	79.4	19.7	3.4	2.4
18	59.96	26.4	33.2	22.7	28.5	29.1	29.3	29.7	29.4	29	80.7	20.4	3.6	2.6
19	60.24	26	31.8	21.8	28.6	29.8	29.3	29.8	29.3	29	81.5	20.3	2.3	2.1
20	60.60	25.9	31.4	22.3	28.5	29.8	29.6	29.8	29.3	29	86.3	21.3	2.3	1.7
21	60.24	26.1	31.8	22	28.4	29.4	29.5	30.2	29.3	29	83.7	20.8	3.3	2.3
22	59.26	26.8	32	22.7	28.6	30.4	29.7	29.9	29.3	29	82.2	21.3	3.5	2.5
23	59.15	25.8	31.5	23.2	29	30.2	29.8	30	29.3	29	82.8	20.3	2.3	2
24	60.31	25.6	31.5	21.7	28.3	30.1	29.7	29.7	29.4	28.9	76.2	18.5	4.3	3.1
25	61.02	25	31	21.2	28.5	29.7	29.6	29.6	29.3	28.9	76.2	17.8	4	2.9
26	60.28	24.6	31.2	19.5	28.4	29.6	29.5	29.6	29.2	28.8	76.5	17.4	3.9	3
27	60.03	25.1	30.9	20.3	28.4	29.4	29.3	29.6	29.3	28.8	78.4	18.4	4.2	3.2
28	60.88	25.3	31.6	21.5	28.5	29.1	29.3	29.5	29.3	28.8	81.8	19.4	3.4	2.5
29	61.13	25.5	31.6	22	28.6	29.1	29.4	29.5	29.3	28.9	81.2	19.5	3.3	2.5
30	60.55	26.2	32.2	22	28.6	29.2	29.3	29.4	29.3	28.8	78.7	19.7	3.7	2.7
31	60.25	25.5	31	21.8	28.5	28.8	29.4	29.3	29.3	28.8	84.8	20.4	2.3	1.6
Mean	758.51	26.1	31.4	22.6	28.9	29.6	29.7	29.9	29.4	29	83.4	20.8	2.8	2.2
Total													87.4	68.6
Departure from normal	-0.14	-0.6	+0.3	-0.5							-0.2	-0.9		

Day.	Prevailing direction.	Wind.		Direction at the time of the maximum velocity.	Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours beginning mid-night.	Miscellaneous.	
		Total move- ment.	Maxi- mum hour- ly veloc- ity.			Form and its direction.					
						Upper.	Lower.				
1	WSW, SW	Km. 111	Km. 13	WSW	0-10. 4.4	Ci.	Cu.	NE by E	h. m. 9 55	mm. 0.3	d a. T < p.
2	SW quad.	121	13	SSW, SW	5.7	Ci.	Cu.	E	7 15		[ < a. p.
3	NE, E	99	9	WNW	8.6	Ci., Ci.-S.	Cu.	E	1 30		[ < a. < p.
4	Variable	110	17.5	WNW	7.9	Ci.-S.	Cu.	E	5 20	24.2	d° a. ● a. p.
5	Variable	113	12	N	8.3	A.-Cu. ENE	Cu.	E	6 35	8.1	T a. p. d° a. p.
6	E quad.	109.5	9	ENE	6.5	A.-Cu. W by N, ENE	Cu.	E	5 20	13.9	● a. p. [ < a. p.
7	NE, WSW	115	13	WSW	4.2	Ci.	Cu.	E	9 35		< p.
8	NE, WSW	108	13	SSW, WSW	4.5	Ci., A.-Cu.	Cu.	E, NE	8 25	1.3	● < p.
9	W quad.	161	16	W, WNW	7.2	Ci. SE	Cu.	E, NE	7 20		T° < p.
10	NW quad.	144	15.5	NNW, WNW	6.8	Ci.-S., ci.-Cu. E	Cu.	NNW	5 30		T° p.
11	N quad.	103	9	NNE, NE	9.9	Ci.-S.	Cu.-N.	NNW	0 00	2.6	d° a. ● a. p.
12	N quad.	124	15	N	10	Ci.-S.	Cu.-N.	N by W	0 00	4.7	d a. ● p.
13	SSW	459	50	SW by W	10	Ci.-S.	Cu.-N.	WSW	0 00	13.1	● a. ● p.
14	SSW	484	39	SW	10	Ci.-S.	N.	SW	0 00	48.5	● a. p.
15	SW, WSW	275	31	WSW	7.8	Ci.-S.	Cu.	NW	5 05		≡ a.
16	W quad.	257	22	SW, WSW	6.6	Ci., A.-cu. WSW	Cu.	NE	7 25		
17	N	150.5	15.5	NNW	3.8	Ci.	Cu.	E	10 05		
18	ESE, SE	87.5	14	NE	4.3	Ci., Ci.-Cu.	Cu.	E	10 00		
19	E quad.	70.5	8.5	N	6.8	Ci.	Cu.	E	6 35	.3	d p.
20	SW, NW	55	9	NW	8.3	A.-Cu.	Cu.	E	5 00	.5	● p.
21	W, WSW	76	10	W	3.9	Ci.	Cu.	E	9 45		T p.
22	WSW	131.5	14	WSW	5.5	Ci.	Cu.	E	9 45		
23	WSW	48	9	NW	8.8	Ci.-S.	Cu.	E	1 50	1.1	● p.
24	WSW	93.5	11	SW	5.2	A.-Cu. NNE	Cu.	E	8 45		
25	WSW, ESE	65	8.5	WSW	6.4	Ci. NNW	Cu.	E	6 20		
26	NNW, SSW	94	14.5	WSW	5.7	Ci.	Cu.	E	9 10		○ a.
27	W	112	14	W	2.8	Ci.	Cu.	E	9 50		
28	W quad.	58.5	7	WSW	7	A.-Cu.	Cu.	E	4 55		
29	W quad.	45	11	W	3.8	A.-Cu.	Cu.	E	6 55		d° p.
30	WSW	79	11	WSW	3.2	Cu.	Cu.	E	9 50		
31	E quad.	92.5	18.5	NE	8.2	Ci.-S.	Cu.	E	3 30	1.1	d° a. [ < d p.
Mean		133.9	15.2		6.5				6 11		
Total		4,152							191 30	119.7	
Departure from normal		-1,182.2			-0.2				+21 18	-67.5	

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.

METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.<sup>a</sup>

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	758.54	26.7	30.7	22.9	86.3	22.2	W, SE	0.5	4.7	Ci.	Cu.	NW		d° a.
2.	58.20	27	31.2	23	87	22.3	SSE, SSW	.7	5.7	Ci.-S.	Cu.	W		
3.	58.44	27.4	32.4	23.7	84.8	22.7	S quad.	1.2	5.2	Ci.-S., Ci.	Cu.	SW, S		∠ <sup>2</sup> p.
4.	59	27.1	31.4	23.5	86.2	22.9	W, S	1	4.8	Ci.	Cu.	SW	1	p <sup>2</sup> p.
5.	58.68	25.5	31.9	22.9	91.2	22	SW quad.	.7	6.3	Ci., Ci.-S.	Fr.-Cu.	W	15	● a. p. ∩ <sup>2</sup> p.
6.	58.48	25.8	31.3	21.5	86.8	21.4	S quad.	.5	8.5	Ci.-S.	Cu.	SSW, SW	11	∩ <sup>2</sup> ● p.
7.	59.02	24.8	30.4	22	93.3	21.6	S quad.	1.3	6.8	Ci.-S.	Cu.	S	28	● a. ● <sup>2</sup> ∠ <sup>2</sup> p.
8.	58.62	25.7	31.2	22.3	90.7	22.1	SSE, SE	.3	5.3	Ci.	Cu.	S		
9.	56.91	26.4	31.3	22.8	89.2	22.6	SW	.2	7.8	Ci.-S.	Fr.-N.	SSW		∠ <sup>2</sup> p.
10.	56.46	26.9	30.8	23.9	88.3	23.1	SW	1.2	9.5	Ci.-S.	Cu.	SSW		d° ∠ <sup>2</sup> p.
11.	55.50	25.6	28.2	24.1	95.2	23.2	SSW	3.2	10	Ci.-S.	Fr.-N.	SW	17.3	d <sup>2</sup> a. ● <sup>2</sup> p.
12.	56.24	24.4	26.2	23.5	98.3	22.4	SSW	3.3	10	Ci.-S.	N.	SW	166.2	● <sup>2</sup> a. p.
13.	55.86	26.1	29.6	24.1	89.8	22.5	S	2.2	10	Ci.-S.	Cu.	SW	1.3	d <sup>2</sup> ∠ <sup>2</sup> p.
14.	56.02	26.9	29.3	24.8	86	22.7	S, SSW	2	8.8	Ci.-S.	Cu.	SSW		d° a.
15.	57.66	26.8	31	24.2	84.7	22.1	S	3.7	8.8	Ci.-S.	Fr.-N.	SW		d° a. p.
16.	59.32	26.2	30.1	23.7	84.5	21.3	SSW	2.7	9.5	Ci.-S.	Fr.-N.	W	2.9	● p.
17.	59.68	25.8	29.7	22.5	87.2	21.4	SW	1.7	8.5	Ci.-S.	Fr.-Cu.	SSW, SW		
18.	60	26.1	30.6	23	89.7	22.2	SSW	.7	6.7	A.-Cu.	Cu.	SW		d° p.
19.	60.09	25.6	30.1	22	89.3	21.7	SW	.7	7.8	Ci.-S.	Cu.	W		d° a.
20.	60.13	25.4	30.8	22.7	89.8	21.6	S quad.	.7	9.2	Ci.-S.	Cu.	W		d° a. ● <sup>2</sup> ∩ <sup>2</sup> p.
21.	59.49	24.9	30.7	22.2	92.5	21.7	SSE	.3	8.3	Ci.-S.	Cu.	S	127.9	
22.	59	25.6	30.6	22.5	89.3	21.8	S	.3	6	Ci.-S.	Cu.	SSW		∩° p.
23.	58.76	26.6	31.7	22.7	87	22.1	Variable	.7	4.3	Ci.	Fr.-Cu.	N		
24.	59.51	25.4	28.4	23.4	92.2	22.2	SSE	.2	8.3	Ci.-S.	Fr.-N.	E, SE	9.1	● a.
25.	60.35	25.4	29.7	23	90.8	21.8	E, S	.8	7.8	Ci.-S.	Fr.-Cu.	SE		d° a.
26.	59.37	25.8	31.3	23	83.5	20.3	SE	1	2.5	Ci.	Cu.	E		
27.	59.43	25.7	30	22	87.2	21.2	SE quad.	.8	2.3	Ci.	Cu.	SE		
28.	59.92	26.1	31	22	90.5	22.6	Variable	1	3.2	Ci.	Cu.	E		
29.	59.79	26.1	30.4	22.8	89.5	22.3	Variable	.7	4.2	Ci.	Cu.	E, ESE		d° p.
30.	59.46	27	33.3	23.4	86.7	22.6	S, SE	.7	5.5	Ci.	Cu.	SE		d° p.
31.	59.18	26.4	31.5	23	87.8	22.2	Variable	1	6	Ci.-S.	Cu.		3.6	● <sup>2</sup> ∠ <sup>2</sup> p.
Mean	758.62	26	30.5	23	88.9	22.1		1.2	6.8					
Total													383.3	

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.			Lower.	
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.		
1.	758.23	27.7	32.8	23.9	78.7	21.4	W quad.	203.5	3.7	Ci.		W	11.2	☉ a.
2.	58.22	26.5	31.4	23.7	82.8	21.1	W quad.	170.1	7	A.-Cu.	SW	W		☉ a. ☐ a.
3.	58.37	26.8	33	23.1	82.7	21.6	W		6.5	Ci.-S.		W	.5	☐ a. ☐ p.
4.	58.96	27.8	32.6	23.9	78	21.3	W	177.9	6	Ci.	S	W		☐ a. ☐ p.
5.	58.34	27	31.8	23.5	79.2	20.8	SSW, WNW	196.3	7.5	Ci.-S.		W	3	☐ a. ☐ p.
6.	58.33	26.9	33	23.3	80	20.7	SW quad.	149.5	6	Ci.-S.		W	2.5	d a. ☉ p.
7.	58.71	26.4	31.2	23.4	83	21	WSW, SW	144.4	6.7	Ci.	S	W	4.1	
8.	58.26	27	32.7	23.5	82.2	21.6	W quad.	155.1	4.2	A.-Cu.	SW	W	12.4	☉ a. ☐ a.
9.	56.70	27.4	31.1	24.2	82.5	22.3	W quad.	235.1	9	Ci.-S.		W	5.1	☐ a. ☐ a.
10.	55.96	27.7	31.9	25	79.7	21.9	WSW	332.5	7.8	Ci.	NNE	W	.5	☐ a. ☐ a.
11.	55.21	27.6	31.8	25	76.8	21	WSW	360.9	9.8			WSW	3.4	☐ a. p. ☉ p.
12.	55.38	27.1	28.6	25.5	76.3	20.3	SW	463.6	10			SW	6.6	☉ a. p.
13.	55.47	27.5	32.8	23.5	71.8	19.3	Variable.	182.4	8.7	A.-Cu.	W			☐ a. p.
14.	55.76	27.3	33.9	23.6	77.2	20.4	WSW	174.1	8.8	A.-Cu.	SW			☐ a. p.
15.	57.08	28.3	32.7	25.4	68.8	19.5	SW	444.5	8.3	Ci.		SW	.5	☉ p.
16.	59.01	28.2	31.9	26.6	72.7	20.6	W quad.	390.9	9.7	Ci.-S.		SW		☐ p.
17.	59.37	28.3	32.3	26.3	72.8	20.6	WSW	310.3	8	A.-Cu.	S	sw		d a.
18.	59.90	28.4	32.9	25	74.7	21.2	W	280.7	7	A.-Cu.	S	W		☐ a.
19.	59.82	27.4	32.8	24.1	77.8	21	WSW	214.3	7.8	Ci.-S., A.-Cu.		SW	21.4	☐ a. a. p.
20.	59.56	25.8	30.3	23.5	88	21.6	W, WSW	237.8	7.7	Ci.		SW	53.8	☐ a. d p.
21.	59.27	25.9	29.7	23.7	89.5	22.2	Calm	114.9	9.2	Ci.-Cu.	NE	SW	1.5	☐ a.
22.	58.57	27.3	31.4	24.5	81	21.7	WSW	263.2	8.5	Ci.		W	5.4	☉ a.
23.	58.36	27.9	32.4	24.7	79	21.8	W quad.	255.4	5.5	Ci.	SW	W	37.6	☉ a.
24.	59.48	25.4	28	23.9	90.3	21.8	SW	138.4	10				16	☉ a.
25.	60.38	26	30.3	23.9	85.7	21.3	Calm	76	7.8	Ci., Ci.-S.	S	N		
26.	59.62	26.2	29	23.4	85.2	21.4	NW quad.	206.1	6.5	A.-Cu.	SW	N		
27.	59.56	26.5	30.3	23.5	81.8	20.9	NNW, ESE	121.9	5.2	A.-Cu.	SW	N		☐ p.
28.	59.85	26.4	30.5	23.6	84.7	21.6	NNE, SSW	121.6	4.3	Ci.		N		
29.	59.90	26.5	30.4	22.8	84.3	21.6	NNW, ENE	123.1	3.5	Ci.	SW		9.4	☉ a. p.
30.	59.50	26.5	31.5	23.1	87.5	22.4	SW	145.4	6.3	Ci.			4.1	d a. ☐ p.
31.	59.39	25.4	27.4	23.8	90	21.6	E, ESE	174.5	8.3	Ci.	SW		1	
Mean	758.40	27	31.4	24.1	80.8	21.2		218.8	7.3					
Total													200	

<sup>a</sup> All the mean values given in these tables are deduced from six daily observations.



## Meteorological data for first and second class stations—Continued.

## CEBU.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied, -1.84 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	758.54	28	32	24.4	76.7	21.3	NW	155	4.2	Ci.	Cu.-N. NNE	-----	☉ ☉ a.
2.	58.36	27.8	31.6	24.5	76	21	Variable	178.8	3.8	Ci.	Cu. NNE	-----	☉ a. ☉ p.
3.	58.47	27.9	30.2	24.8	75.2	20.9	SW	241.4	5	Ci.	Cu. NNE	54.4	☉ a. ☉ p.
4.	59.06	26.7	31	22.2	81.8	21.2	Variable	253.9	6.5	Ci.-S.	Cu.-N. SW	11.4	☉ a. ☉ p.
5.	58.71	26.4	29.5	24	82.3	21.1	NE	170.5	5	Ci.-S.	Cu.-N. SW	14.2	☉ a. ☉ p.
6.	58.55	26.3	30.9	24	81.8	20.7	Variable	194.5	5.8	Ci.-S.	Cu.-N. SW	7.1	☉ a. ☉ p.
7.	59.02	26.2	31.9	23.8	81.2	20.4	Variable	161.8	5.2	Ci.	Cu.-N., Cu. SW	-----	☉ a. ☉ p.
8.	58.64	26.3	31	23.5	80.2	20.2	Variable	171.7	4.3	Ci.	Cu.-N. W	19.6	☉ a. ☉ p.
9.	56.97	26.4	32	23.2	79.5	20.2	Variable	165.4	6	Ci.-S.	Cu. W	79.7	☉ a. ☉ p.
10.	56.30	27.4	30	24.5	79.5	21.5	SW	366.9	6.7	Ci.-S.	cu., cu.-N. wsw	-----	☉ a. ☉ p.
11.	54.92	27.7	30	26.3	77	21.3	SW	828.6	6.8	Ci.-S.	Cu.-N. SW	2	☉ a. ☉ p.
12.	55.35	25.9	28.5	23.2	85.7	21.2	SW	1,126.4	8.7	A.-Cu.	Cu.-N. SW	25.7	☉ a. ☉ p.
13.	55.73	27.1	29.9	24.8	75.8	20.1	SSW	902.8	8.4	A.-Cu.	Cu.-N. SW	-----	☉ a. ☉ p.
14.	56.08	27.5	29.4	23.5	77.6	21.1	SSW	989.9	8	Ci.-S.	Cu.-N. SW	1	☉ a. ☉ p.
15.	57.87	28.8	30.6	26	68.2	19.9	SW	1,037.1	7.6	Ci.-S.	Cu. W quad.	-----	☉ a. ☉ p.
16.	59.32	27.3	29	24.5	79	21.3	SW	589.5	6.3	Ci., A.-Cu.	Cu.-N. SW	12.5	☉ a. ☉ p.
17.	59.43	26.8	29.3	22.7	79	20.6	SW	494.5	6.7	Ci., A.-Cu.	Cu.-N., Cu. SW	26.2	☉ a. ☉ p.
18.	59.93	26.7	30	24.6	81	21	SW	303.1	6.7	A.-Cu.	Cu.-N. WSW	12.2	☉ a. ☉ p.
19.	60.07	26.4	30.7	24	82.3	21	NW, SW	148.5	6.2	Ci., Ci.-S.	Cu.-N. WSW	1.3	☉ a. ☉ p.
20.	59.96	25.9	29.2	24	86.3	21.4	NE	228.3	7.7	Ci.-S.	Cu.-N. WSW	16.2	☉ a. ☉ p.
21.	59.47	26.4	30.5	23.8	84.2	21.4	SW	190.4	7.5	A.-Cu.	Cu.-N., S.-Cu.	4.6	☉ a. ☉ p.
22.	58.81	27	30	24.1	78.5	20.8	SW	285.8	6.2	Ci.-S.	cu., cu.-N. NW, W	4.1	☉ a. ☉ p.
23.	58.77	27.4	30.5	24	74.8	20.3	SW	313.8	5.5	Ci.	S.-Cu. W	-----	☉ a. ☉ p.
24.	59.52	27.6	30.2	24.6	75.7	20.7	NE	197.4	6.3	Ci.-S.	S.-Cu. N	-----	☉ a. ☉ p.
25.	60.27	27	29.9	23.9	69	18.1	N	384.4	3.3	Ci.	Cu. N	-----	☉ a. ☉ p.
26.	59.45	26.4	30.4	23	67.3	17.1	N	347.1	3.7	Ci.	Cu. W, NW	-----	☉ a. ☉ p.
27.	59.50	26.8	30.5	22.5	67	17.5	NE	215.2	2.8	Ci.	Cu. W	-----	☉ a. ☉ p.
28.	59.93	26.9	32	23.9	74.5	19.5	NW	165.5	3.8	Ci.	Cu. NNE	7.1	☉ a. ☉ p.
29.	59.87	27.1	31.1	22.8	78	20.6	N quad.	197.9	4.5	Ci.	Cu., Cu.-N. N	-----	☉ a. ☉ p.
30.	59.44	26.8	31.5	24.2	77.7	20.3	NE	294.5	4.2	Ci.	Cu. NE	18.8	☉ a. ☉ p.
31.	59.32	26.5	28.5	23.2	81.2	20.8	N, NE	305.6	6.7	Ci.-S.	Cu.-N. NE	-----	☉ a. ☉ p.
Mean	758.57	26.9	30.4	24	77.9	20.5		374.4	5.8				
Total								11,606.2				318.1	

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied, -1.84 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	758.58	26.7	31	23.8	81.5	21	Variable	121.7	3.8	Ci.	Cu.	0.8	☉ a. ☉ p.
2.	58.18	26.8	31	23.1	82.8	21.5	SW	128.7	3.7	Ci.	Cu.	101.7	☉ a. ☉ p.
3.	58.32	27.1	30.8	24.5	81.8	21.6	SW	168.1	4.2	Ci.	Cu.	80.3	☉ a. ☉ p.
4.	59.06	27	29.9	24.8	79.2	21	SW	164	6	Ci.-S., Ci.	Cu.-N.	73.2	☉ a. ☉ p.
5.	58.62	27	30.1	23.6	79.7	20.9	SW	144.6	5.5	Ci.-S.	Cu.-N.	1.3	☉ a. ☉ p.
6.	58.22	26.8	30.5	23.7	80	20.7	SW	182.2	5.5	Ci.	Cu.	1.3	☉ a. ☉ p.
7.	58.88	26.1	30.1	24	81.7	20.4	SW	143.5	5.7	Ci., Ci.-S.	Cu.	25.9	☉ a. ☉ p.
8.	58.62	25.9	30.9	22.8	80.3	19.8	SW	116.1	5.7	Ci.	Cu.	1.3	☉ a. ☉ p.
9.	57.07	26.7	30.9	22.8	79.7	20.5	Variable	135.8	6.3	Ci.	Cu.	1.3	☉ a. ☉ p.
10.	56.06	27.4	30.6	24	81.3	22	SW	235.7	9.5	Ci.-S.	Cu.-N., Cu.	2.6	☉ a. ☉ p.
11.	54.91	27.4	30.5	25	81.2	22	SW	323.7	9.8	Ci.-S.	Cu.-N.	101.7	☉ a. ☉ p.
12.	54.76	26	28	23	89	22.3	SW	481.1	10	Ci.-S.	Cu.-N. SW	80.3	☉ a. ☉ p.
13.	54.89	25.7	27.5	22.8	89	21.8	SW	610.6	10	Ci.-S.	N. SW	73.2	☉ a. ☉ p.
14.	55.13	26.2	28.5	22.5	86.7	21.8	SW	627.3	10	Ci.-S.	N. SW	1.3	☉ a. ☉ p.
15.	56.60	27.4	29.4	24.8	75.2	20.4	SW	652.4	9.7	Ci.-S.	Cu.-N. SW	1.3	☉ a. ☉ p.
16.	58.58	27.8	30	25.9	77.5	21.5	SW	379.9	8.3	Ci.-S., Ci.	Cu.	19.9	☉ a. ☉ p.
17.	59.28	26	29	24.3	84.7	21.2	SW	331.3	9.3	Ci.-S.	Cu.-N.	39.1	☉ a. ☉ p.
18.	59.70	25.9	29.5	23.4	88.7	21.9	SW	199	8.3	Ci.-S.	Cu.	1.3	☉ a. ☉ p.
19.	59.94	25.8	29	24	87.5	21.6	SW	120.6	9.2	Ci.-S.	Cu.-N.	13.7	☉ a. ☉ p.
20.	60.05	25.1	29.5	23.4	88.5	20.9	N	155.9	9.3	Ci.-S.	Cu.-N., Cu.	1.3	☉ a. ☉ p.
21.	59.50	26.8	30	24.2	81	21.1	N, NE	218.7	8	Ci.-S.	Cu.	5.3	☉ a. ☉ p.
22.	59.02	26.5	29.8	23.4	80.5	20.6	SW	149.3	5.2	Ci.	Cu.	1.3	☉ a. ☉ p.
23.	58.76	26.1	30.5	23.3	83.8	20.9	W	140.4	7.3	Ci.-S., Ci.	Cu.-N., Cu. NE	1.3	☉ a. ☉ p.
24.	59.49	26.7	30.5	24	77.5	19.9	N	383.9	7.2	Ci.-S.	Cu.	1.3	☉ a. ☉ p.
25.	60.31	26.2	30.3	23.2	74.5	18.7	N, NNE	422.4	4.7	Ci.	Cu.	1.3	☉ a. ☉ p.
26.	59.42	25.9	30.5	22.3	70.2	17.2	N	389.6	3.2	Ci.	Cu.	1.3	☉ a. ☉ p.
27.	59.33	25.9	30.4	21.1	73.5	18.2	NE	271	4	Ci.	Cu.	1.3	☉ a. ☉ p.
28.	59.78	26.4	31	22.3	76.7	19.5	NE	385.3	3.5	Ci.	Cu.	1.3	☉ a. ☉ p.
29.	59.91	26.5	30	23.6	80.3	20.5	NE quad.	406.2	4.8	Ci.	Cu.	5.1	☉ a. ☉ p.
30.	59.44	26.6	30.2	23.5	82	21	NE quad.	370.6	5.8	Ci.	Cu.-N., Cu.	5.1	☉ a. ☉ p.
31.	59.14	25.8	28.5	23.7	87	21.4	NE	263.6	9.7	Ci.-S.	Cu.-N.	4.3	☉ a. ☉ p.
Mean	758.37	26.5	29.9	23.6	81.4	20.8		284.6	6.9				
Total								8,823.2				381.9	

\* Mean deduced from five observations.

b Deduced from four observations only.

*Meteorological data for first and second class stations—Continued.*

ORMOC.

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied,  $-1.83$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.	Km.	0-10.				mm.		
1.	758.70	25.3	30.7	22.9	90.2	21.5	N quad.	107.5	4.7	Ci.-S.	Cu.-N.	21.3	☉ a. T. ● <sup>2</sup> p.	
2.	58.47	25.1	30.2	22.3	90.5	21.4	Variable	107.4	6.5	Ci.-S.	Cu.-N.	9.4	☉ a. d. ● <sup>1</sup> p. ☐	
3.	58.66	25.1	30.9	22.6	86.2	22.4	SE quad.	142.3	4.8	A.-Cu. SW, WSW	Cu.-N.	W	☉ a. < p.	
4.	59.28	26.3	30.1	22.8	87.2	22.2	E. S.	123.9	6.2	A.-Cu. W	Cu.-N.	WSW, W	2.3	p d a. ☐ a. p.
5.	58.94	26.5	31.1	22.9	84.7	21.7	N. NW	114.5	6.5	Ci.-S. NNW, NW	Cu.-N.	W	☐ a. ☐ a. ☐ p.	
6.	58.66	26.4	31.1	22.9	82.2	21.9	NW W	125.6	6.5	A.-Cu. SW	Cu.-N.	WNW	☉ a. < p.	
7.	59.07	25.9	31.1	22.9	91.3	21.7	NW	89.4	6.2	Ci.-S.	Cu.-N.	WNW	14.2	☐ a. d. ● a. < a. p.
8.	58.77	25.9	30.3	22.9	91.7	21.7	NW	80.3	6.7	Ci.-Cu. N	Cu.-N.	NW	8.4	☐ a. d. a. ☐ p.
9.	57.13	26.3	30.9	23.2	85.2	22.2	NW quad.	105	7.8	Ci.-S. E	Cu.-N.	WNW	5.5	☐ p a. ☐ p.
10.	56.35	25.8	29.8	23.2	90.3	22.2	N	115.9	9.2	Ci.-S.	Cu.-N.	W	9.9	p d a. d. a. p. ☐
11.	55.07	25.8	30.6	22.4	90.3	22.4	N quad.	316.2	10	Ci.-S.	Cu.-N.	WSW	164.4	d a. ☐ a. ☐ a. p. p
12.	55.33	27.9	30.3	23.7	85.3	22.4	SSW	733.7	10	Ci.-S.	Cu.-N.	sw, WSW	3.1	☐ a. a. d. a. p. p
13.	55.72	27.9	29.9	26.2	78.2	21.7	S	590.7	10	Ci.-S.	Cu.-N.	SW	5	☐ a. p.
14.	55.92	28	30.3	26	76.7	21.4	SE quad.	469.7	8.3	A.-Cu. W	Cu.-N.	SW	-----	☐ a. ☐ p.
15.	57.16	28.6	31.4	25.1	75.5	21.8	SW, S	559.3	8.7	A.-Cu. SW	Cu.-N.	WSW	-----	☐ a. ☐ p.
16.	59.08	28	30.1	25.9	80.7	22.5	S	339.2	9.8	Ci.-Cu. A.-Cu. SW	Cu.-N.	WSW	-----	☐ a. ☐ p.
17.	59.48	26.9	30.6	23.8	86	22.5	S	224.1	8.5	Ci.-Cu. ENE	Cu.-N.	W	18.3	☐ a. ☐ p.
18.	60.4	26.4	30.4	23.9	88.3	22.5	N	105.3	8.5	A.-Cu. Variable	Cu.-N.	W	1.3	☐ a. ☐ p.
19.	60.15	26.3	29.7	22.9	86.8	22	Variable	96.4	8.5	A.-Cu. NW, WNW	Cu.-N.	W, WNW	5	☐ a. a. p d p.
20.	60.15	25.1	30.2	23.6	93.3	22	NW quad.	70.9	9.3	Ci.-S.	Cu.-N.	NW	26.4	d a. p. ● p.
21.	59.71	25.4	29.1	22.5	89.3	21.5	W quad.	116.8	8.7	Ci.-S. E	Cu.-N.	NNE, NE	3	☐ a. p. < p.
22.	59.07	25.8	30.6	22.8	89.8	22.1	NW	87.4	8.2	Ci.-S.	Cu.-N.	W	8.1	☐ d. ● a. p < p.
23.	58.80	26.4	31.4	23.3	86.2	21.9	NW	118.9	8	Ci.-S.	Cu.-N.	W quad.	6.3	p d a. < p.
24.	59.63	26	30.6	22.7	85.5	21.2	NW	86.9	8.3	Ci.-S.	Cu.-N.	NNE, N	-----	d a. < p.
25.	60.54	25.7	31.2	21.3	78.7	18.9	Variable	119.3	4.8	Ci.-S. NNW, N	Cu.-N.	S-Cu.	-----	☐ a. ☐ p.
26.	59.63	24.7	31.2	20.4	77.7	17.5	NW	125	2.8	Ci.-Ci.-S.	Cu.-N.	NNE	-----	☐ a. ☐ p.
27.	59.62	25.3	31.3 <sup>7</sup>	19.8	80.7	19.1	Variable	127.4	3.2	A.-Cu., Ci.	Cu.-N.	E	-----	☐ a. ☐ p.
28.	60.02	26.3	31.2	21.1	80.8	20.3	E, SE	125.5	5.2	Ci.-S.	Cu.-N.	NE	5	☐ a. + d. ● < p.
29.	60.11	25.9	31.3	22	83.2	20.2	NE quad.	132.6	6	Ci.-S.	Cu.-N.	NE	23.4	☐ a. + d. ● < p.
30.	59.69	26.4	32.2	22.1	84	21.2	N quad.	135.8	6.7	Ci.-S.	Cu.-N.	NE	9.7	☐ a. + d. ● < p.
31.	59.71	25.6	29	23.3	89.3	21.6	E quad.	108.1	10	Ci.-S.	Cu.-N.	ESE	6.9	☐ p a. d a. p < p.
Mean	758.67	26.2	30.5	23.1	85.4	21.4		191.6	7.4					
Total								5,940.3					335.7	

**TACLOBAN.**

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.	0-12.	0-10.			mm.		
1.	758.20	27.6	32.7	23.6	81.7	22.2	NW, W		Ci.-S.		W		
2.	58.26	26.8	33.5	23.6	87.5	22.8	Variable	1.7	4.8	Ci.-S.	W	D <sup>2</sup> a. ● a. p. < p.	
3.	58.16	27.8	33.3	23.7	81.8	22.5	Variable	.5	4.2	Ci.	SW	D <sup>2</sup> < a.	
4.	58.85	27	31.3	24.2	83	21.8	Variable	.7	6.7	Ci.-S.	W	< a. □ & p.	
5.	58.40	27.5	32.6	23.2	81.3	21.8		1	6.2	Ci.-S.	WNW	a. p.	
6.	58.26	26.1	32.6	23.4	87.7	21.6	WNW	.3	6	SSW	Cu.-N.	D <sup>2</sup> a. ● p.	
7.	58.78	26.7	32.6	23.3	88.7	20.9	NW	1.2	4.7	SSW	Cu.	D <sup>2</sup> a. ● p.	
8.	58.23	27.6	33.6	24	77.8	20.9	NW	.5	4	Ci.-S.	Cu.	D <sup>2</sup> a. ● p.	
9.	56.66	27	33.2	24	90.5	21.9	NW quad.	1	6.8	SSW	Cu. WNW	□ a. p. d & p.	
10.	58.82	25.6	27.5	24	90.5	22	WNW	1	8.5	Ci.	W	10.5	
11.	54.41	26.4	32.4	23.7	87	22.1	S quad.	1	8.8	Ci.	SW	62.3	
12.	54.42	26.3	31.3	23.2	83.2	21.3	SSW	1.8	9.2	Ci.-N.	WSW	6.9	
13.	55	26.3	31.3	23.7	79.2	20	S quad.	2	9.2	Ci.-N.	SW	7.6	
14.	55.21	27.6	32	24.2	73.2	19.9	SSW	1.5	8.2	Ci.-S.	Cu.	d a. p.	
15.	56.26	28	32.5	24.6	78.7	19.9	SSW	2	7.2	Ci.	SW	1	
16.	58.38	27.6	32.7	24.6	78.7	21.1	W, WSW	.8	6.2	Ci.-S.	E	< p.	
17.	59.08	25.8	30.5	23.3	88.3	21.7	Variable	.5	7.3	Ci.-S.	E	1.84	
18.	59.64	26.8	30.2	23.5	85.8	22	Variable	1.2	6.2	Ci.-S.	E	34.5	
19.	59.68	26.4	31.6	23.3	85.8	21.8	NW quad.	1.2	9.7	Ci.-S.	N	48.2	
20.	59.86	25.2	29	23.8	93	22.1	NW, WNW	1.2	7.3	Ci.	N	& a. p.	
21.	59.46	26.2	30.4	23.3	86.3	21.6	NW	1.3	7.7	Ci.	S	& a. p.	
22.	58.50	27.1	31	24	81.7	21.5	NW	1.3	7.5	Ci.	SE	& a. p.	
23.	58.36	27.4	32	24.6	79.3	21.4	NW	1.5	7.3	Ci.	SE	1.3	
24.	59.51	26.6	29.9	24	80.8	20.8	NW	1.5	5.7	Ci.	SE	5.8	
25.	60.45	26.1	30.6	23.3	79.3	19.7	NW	.8	2.3	Ci.		D <sup>2</sup> a. p.	
26.	59.51	26.3	31	21.6	75.8	18.8	NW quad.	.7	3.8	Ci.		D <sup>2</sup> a. p.	
27.	59.42	26.4	31.7	21.4	77.3	19.4	NW	.3	7	Ci.		D <sup>2</sup> a. p.	
28.	60.03	26.9	32.5	23.2	81.2	21.2	NW, NNW	.5	3.7	Ci.-S.		< a. p.	
29.	60	26.8	32.4	23.6	85.3	21.9	Variable	1.2	6.2	Ci.-S.	SSW	< a. p.	
30.	59.70	27.2	32	23.4	84.5	22.3	NW, SSW	.7	8.8			18.6	
31.	59.88	24.9	26.5	22.6	91.8	21.5	Variable	.7			ESE	29.7	
Mean	758.26	26.7	31.5	23.5	82.7	21.3		1	6.5				
Total												252.8	

**CAPIZ.**

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.	Upper.		
1.	758.74	26.8	32.7	23.2	86.2	22.4	WNW	83.4	3.8	Ci.	Cu., N.	0.5	☉ a. < p.
2.	58.29	27.2	33.8	23.5	86.2	22.8	NW, NNW	71.9	3.7	Ci.	N., Cu.		☉ p.
3.	58.39	26.5	33.7	23.8	89.3	22.9	N	58.9	5.5	Ci. & S.	N.		☉ a. < p.
4.	59.25	25.4	32.9	23.7	90.8	21.9	S	64.5	6.2	Ci. & S.	N.	5	☉ a. < p.
5.	58.74	26.2	32.8	23.3	88.2	22	NW	76.2	8	Ci.	N.	3	☉ a. < p.
6.	58.31	25.8	32.2	22.7	87.3	21.4	S	68.5	6	Ci.	Fr.-N.		☉ a. < p.
7.	59.04	25.6	32.2	22.3	87.5	21.6	SSW, NW	57	6.7	Ci.	Cu.		☉ a. < p.
8.	58.67	26.2	31.8	22.3	86.3	21.6	N, NE	66.6	5.7	Ci.	Fr.-N.		☉ a. < p.
9.	57.25	26.3	30.6	23.3	86.5	21.8	Variable	106.8	9.2	Ci. & S.	N.	3	☉ a. < p.
10.	56.15	25.7	30	23.6	92.2	22.5	NNW, NW	83.8	9.7	Ci.	NW	2	☉ a. < p.
11.	54.72	25.7	30.4	22.9	89.3	21.9	NW, NNW	147.2	9.7	Ci. & S.	NW	4.1	☉ a. < p.
12.	54.57	25.2	32	22.7	90.3	21.4	S, SSW	161.7	9.8	Ci.	N.	38.3	☉ a. < p.
13.	54.47	24.6	29.3	23.2	92.5	21.1	SW	271	10	Ci. & S.	N., S, SW	17.6	☉ a. < p.
14.	54.67	25.7	31	23.5	86.2	21.1	S	330	9.7	Ci. & S.	N.	11.4	☉ a. < p.
15.	56.07	26.7	32.4	22.5	82.5	21.2	W, SW	220	9.3	Ci. & S.	N.	2	☉ a. < p.
16.	58.61	26.6	33.7	22.7	85.7	21.1	Calm	56.9	7.7	Ci. & S.	N.	5	☉ a. < p.
17.	59.27	25.6	32.8	23.4	88.7	21.5	S	95.9	7.2	Ci., Ci.-S.	N.	3	☉ a. < p.
18.	59.88	25.4	31.9	22.8	90.7	21.7	NW	70.5	8.5	A.-Cu.	N., S, W	7	☉ a. < p.
19.	60.12	25.9	31.4	23.6	88.7	21.8	N	64	8.7	Ci., Ci.-S.	N.	48	☉ a. < p.
20.	60.30	25.7	30.6	23.5	91.8	22.5	NW, NE	76.2	9.5	Ci.-Cu., Ci.-S.	N.	11	☉ a. < p.
21.	59.85	26.2	31.4	22.8	86.5	21.7	NNE, NE	88.9	6.7	Ci.	Cu., NE, N		☉ a. < p.
22.	59.18	26.3	31.7	23.2	84.7	21.3	W	102.5	4.7	Ci.	Cu.	2	☉ a. < p.
23.	59.02	26.4	31.8	22.8	86.2	21.8	N	164.1	6	Ci.	Variable NW	2	☉ a. < p.
24.	59.93	27.2	31.8	25.7	75	20.1	NNE	332.2	5	A.-Cu.	NNE		☉ a. < p.
25.	60.82	26.4	31.4	23.4	75.5	19.2	N	160.6	3.8	Ci.	Cu., Fr.-N. NNE		☉ a. < p.
26.	59.91	26.5	31.5	22.8	70	17.8	N	182.8	3.3	A.-Cu.	Fr.-N.		☉ a. < p.
27.	59.85	25.6	31.9	22	80.8	19.4	N, NNE	78.2	.7	Ci.	Variable NW		☉ a. < p.
28.	60.43	26.2	32.4	21.6	82.7	20.7	N	166.5	4.5	Ci.	Cu.	1.6	☉ a. < p.
29.	60.49	27	32.4	25	82	21.7	NE, N	217.3	6.5	Ci.	N.	3	☉ a. < p.
30.	59.92	27.7	32.4	25.3	81	22.2	NE	206.4	4.5	Ci.	Cu.	.3	☉ a. < p.
31.	59.37	26.1	29.4	24	87.7	22	NE, E	188.1	8.3	Ci.-S.	N.	27.7	☉ a. < p.
Mean	758.52	26.1	31.8	23.3	85.8	21.4							

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.80$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humid-ity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours be-ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
1.	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	758.23	26.4	31.7	22.7	86.2	21.8	N	0.8	2.5	0.3		0.3	☉ a. ☐ d < p.
2.	58.06	26.2	31.4	22.7	88.3	22.8	N	.8	2.7			0.3	☉ a. ☐ d < p.
3.	58.18	27.	32.4	23.2	86.8	22.6	N quad.	.8					☉ a. ☐ d < p.
4.	58.90	26.9	32.8	22.9	85.7	22.4	N	1	5.7				☉ a. ☐ d < p.
5.	58.53	26.1	32.5	22.6	86.3	21.7	N quad.	.7	6				☉ a. ☐ d < p.
6.	58.16	25.9	32.6	22.6	85.3	21.6	N	1.2	5.5				☉ a. ☐ d < p.
7.	58.81	25.9	32.7	22.4	86.3	21.2	N	.8	3.8			33.6	☉ a. ☐ d < p.
8.	58.95	25.7	31.7	22.5	89.	21.7	N	.8	4.3			1	☉ a. ☐ d < p.
9.	56.62	25.7	30.4	22.4	87.7	21.6	N, NW	1	8.3			2	☉ a. ☐ d < p.
10.	55.45	27.3	30.9	23.6	88.2	22.3	SW	1.2	9			16.2	☉ a. ☐ d < p.
11.	54.44	28.7	28.7	24	84.5	22.6	SW, SSW	1.8	10			25.2	☉ a. ☐ d < p.
12.	53.78	26.6	29.	24.2	88.	22.8	S	2.5	10			21.7	☉ a. ☐ d < p.
13.	54.56	26.4	27.9	24.5	86.2	21.9	S	3.2	10			3.6	☉ a. ☐ d < p.
14.	54.61	27.9	28.9	23.7	78.3	21.9	S	3.2	9.5			3	☉ a. ☐ d < p.
15.	55.98	27.7	29.4	24.9	79.7	21.9	SSW	3.2	9.7			4.6	☉ a. ☐ d < p.
16.	58.37	27.8	30.2	25.7	82.8	22.9	SW	1.7	7.3			16.3	☉ a. ☐ d < p.
17.	59.02	26.4	30.4	23.1	79.7	22.8	SW	1.5	9.5			45.7	☉ a. ☐ d < p.
18.	58.57	26.7	31.6	24.	88.	22.8	SW	1.2	7.5				☉ a. ☐ d < p.
19.	59.72	25.6	30.2	23.3	90.2	21.8	N	.7	8.5			2.3	☉ a. ☐ d < p.
20.	59.92	25.5	29.7	23.4	91.5	22.1	NNE, NNW	.3	9.8			4.8	☉ a. ☐ d < p.
21.	59.36	25.9	31.9	22.5	87	21.4	N	.8	7.7				☉ a. ☐ d < p.
22.	58.51	25.5	32.9	22.6	84	21.2	NNW	1	5.3			1.8	☉ a. ☐ d < p.
23.	58.33	26.3	31.7	22.8	83	20.8	NW quad.	.8	5.3			2.5	☉ a. ☐ d < p.
24.	59.49	26.3	31.7	22.8	83	20.8	NNW	1	3.5				☉ a. ☐ d < p.
25.	60.53	25.3	32.1	20.6	80.2	18.7	N	1	1.2				☉ a. ☐ d < p.
26.	59.64	25.4	32.2	19.7	78.2	18.2	N	1	1.5				☉ a. ☐ d < p.
27.	59.56	25.2	31.6	20.3	83.7	19.8	N	1	2				☉ a. ☐ d < p.
28.	60.05	26.2	31.4	22.8	83.5	20.8	N quad.	1	4.5				☉ a. ☐ d < p.
29.	60.09	25.5	30.7	22.4	88.7	21.4	N quad.	.8	7.7				☉ a. ☐ d < p.
30.	59.72	26.8	32.3	22.	82.8	21.3	Variable	.5	6			15.8	☉ a. ☐ d < p.
31.	59.81	24.3	27.6	22.2	94.5	21.2	N	.7	9.3			12.7	☉ a. ☐ d < p.
Mean	758.19	26.3	31	22.9	85.7	21.6		1.2	6.4				
Total												220.1	

## Meteorological data for first and second class stations—Continued.

## LEGASPI.

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied, -1.77 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum. <sup>a</sup>	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.	Upper.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	758.26	27.4	33.8	22.4	80.5	21.4	Calm	40.7	1.2	Cl.-S.	Cu.-N. NNE	4.1	● p.
2.	57.79	27	33.5	22.6	84.3	22.2	NE	48.2	3.2	Cl.-S.	Cu.-N. NE		☞ ☞ ☞ p.
3.	58.14	27.5	34	22.6	81	21.7	NE	46.9	4.7	Cl., Cl.-S.	Cu., Cu.-N. NE	13.5	☞ ☞ ☞ p.
4.	58.78	26.9	31.9	23.3	85.8	22.3	Calm	45.8	6.3	Cl.-S.	Cu.-N. NE	3	☞ ☞ ☞ p.
5.	58.30	26.4	32.4	22	83.5	21.1	Calm	33.9	4.2	Cl., Cl.-S.	Cu., Cu.-N. NE		☞ ☞ ☞ p.
6.	58.18	25.8	32.4	22.1	87.7	21.5	WNW	35	2.7	Cl.-S.	Cu.-N. NNE, NE		☞ ☞ ☞ p.
7.	58.82	26.1	34.2	22	85.5	21.3	NE	55.8	3.7	Cl., Cl.-S.	N. NNE		☞ ☞ ☞ p.
8.	58.19	27	34.2	22	81.5	21.1	NE quad.	96.2	1.7	Cl., Cl.-S.	Cu. NE		
9.	56.55	26.4	30.9	22.4	85.7	21.6	Calm	50.2	7.2	Cl.-S.	Cu.-N. ENE, NNE	13.7	● a. ☞ ☞ ☞ p.
10.	55.11	25.8	30.8	23.4	88.7	21.8	WSW	124.8	8	Cl.-S.	N. N	14.6	● p.
11.	51.40	25	26.5	23.7	90	21.2	SW	504.6	10	Cl.-S.	Fr.-N. SW quad.	227.1	● a. ● <sup>2</sup> p.
12.	51.81	24.1	25.9	23	91.8	20.5	SW	457.9	10	Cl.-S.	N., Fr.-N. WSW	118.6	● <sup>2</sup> a. ● p.
13.	53.01	25.6	28.2	24	89	21.7	SW, SSW	472.7	10	Cl.-S.	Fr.-N. SW quad.	32.1	● <sup>2</sup> a. ● p.
14.	53.36	26.4	31.1	24	85.7	21.8	SW	409.8	9	Cl.-S.	Fr.-N. SSW	14.8	● a. ● <sup>2</sup> p.
15.	54.83	26.4	31.1	24.3	86.5	22.2	SW	363.1	9.8	Cl.-S.	Fr.-N. SW quad.	1.8	● a. d p.
16.	57.90	27	31	24.6	84.3	22.3	W, WSW	132	6.5	Cl.-S.	Cu., Cu.-N. WSW, W		d <sup>2</sup> a. p <sup>2</sup> p.
17.	58.46	26.7	32.5	23.6	83.5	21.5	WSW	109.4	3.8	Cl.-S.	Cu., Cu.-N. wsw		
18.	59.73	26.7	31.7	23.5	82.2	21.2	NNE	121.7	5.5	A.-Cu. E	Cu. ENE		
19.	59.95	26.1	30.5	22.5	83.8	21	NE, E	69	6.5	A.-Cu. ESE	Cu., Cu.-N. NE	8.6	● p.
20.	59.98	27.6	32	24	77.3	21.1	NNE	118.9	4.2	Cl.-S. ESE	Cu. NE, NNE		● a.
21.	59.54	27.1	32.8	22	77.2	20.5	NE	80.3	5.3	Cl. E	Cu. NE		
22.	58.41	26.5	33.7	21.6	82.2	20.9	Calm	18.2	6.5	Cl.-S.	Cu., Cu.-N. W		☞ p.
23.	58.29	26.9	31.5	24	80.8	21	N	83.4	6	Cl.-S.	Cu. NNE, NNW		d <sup>2</sup> p.
24.	59.69	27	31	23.6	82.3	21.8	NE	130.1	3	Cl.	Cu. W		
25.	60.67	25.8	30.2	20.1	77	18.7	NE	173.1	3	Cl.-S.	Cu. ENE		d <sup>2</sup> a.
26.	59.70	25.1	32.3	18.4	82	19.4	NE	200.1	.3	Cl., A.-Cu.	Cu.		
27.	59.70	25.7	33	18.7	77.8	18.9	NNE, NE	199.8	1.2	A.-Cu. NNE	Cu.		
28.	60.44	26.4	31.8	23.2	81.5	20.7	NNE	297.9	6.2	A.-Cu. NE	Fr.-N. NE	7.1	● p.
29.	60.46	26.9	30.8	22.9	79.7	20.8	NNE	346.2	7	Cl.-S.	N., Fr.-N. NE, ESE	.8	d <sup>2</sup> p.
30.	59.99	27.2	32.4	24	81.2	21.7	NE, NNE		3.7	Cl.	Cu. ENE	24.1	d a. ☞ ☞ p.
31.	60.10	25.5	30.2	23.5	90.2	22	NE	204.5	10	Cl.-S.	N. E	11.5	● a. p.
Mean	757.92	26.4	31.6	22.7	83.6	21.2		168.3	5.5				
Total												495.4	

## ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.		
1.	758.19	27.1	31	23.6	83.5	22.1	NW quad.	213.2	4.3	Cl.	NW		☉ p.	
2.	58.13	27.5	30.8	23.9	82.5	22.2	NE, NW	242.5	5.8	Cl.	S.-Cu.		☉ p.	
3.	58.34	26.2	28.7	24.1	89.2	22.5	N	264	7	Cl.	S.-Cu.	27.8	☉ a. ☉ p.	
4.	58.99	26.5	29	23.7	83.8	21.4	NW	300.1	7.5	Cl.	S.-Cu., N. NE, N	8.4	☉ a. ☉ p.	
5.	58.79	25	27.8	23.4	92.7	21.8	SW, NW	286.9	8.7	Cl.	N. NE, NW	34	☉ a. ☉ p.	
6.	58.29	25.7	28.4	23.3	89.2	21.9	N quad.		8.3	Cl.-S.	S.-Cu.	4.1	☉ a. ☉ p.	
7.	58.83	26.5	30.1	22.3	84.3	21.6	Variable	236.4	4.7	Cl.	Cu.		☉ a. ☉ p.	
8.	58.50	28	30	23.7	79	22.1	NE, N	350.6	5.2	Cl.	Cu.		☉ a. ☉ p.	
9.	57.21	26.9	28.8	24	82.7	21.8	N	347.8	7.7	Cl.-S.	S.-Cu.	N	☉ a. ☉ p.	
10.	55.96	26.3	28.2	24.8	86.3	22	NW, N	406.1	9.2	Cl.-S.	S.-Cu.	N	☉ a. ☉ p.	
11.	54.35	24.6	26.2	22	90.2	20.7	NW	409.7	10	Cl.-S.	N.	NW	69.9	☉ a. ☉ p.
12.	53.34	23.9	26	22.2	91.2	20.2	SW	326.3	10	Cl.-S.	Fr.-N.	W	39	☉ a. ☉ p.
13.	51.83	26.1	27.8	23.5	87.2	21.8	SW	393.4	10	Cl.-S.	S.-Cu.	SW	4.3	☉ a. ☉ p.
14.	52.09	25.5	26.6	24.2	88.7	21.6	SSW	305.4	10	Cl.-S.	S.-Cu., N.	SW	22.6	☉ a. ☉ p.
15.	54.43	27.5	32.2	23.9	80.5	21.7	SW	319.1	8	A.-Cu.	SE	SW		☉ a. ☉ p.
16.	57.78	25.9	31.2	23	86.7	21.3	SW	235.6	6.5	A.-Cu.	W	SW, W	1.3	☉ a. ☉ p.
17.	59.19	24.3	27.9	21.6	91.2	20.6	SW, N	289.1	8.3	Cl.-S.	S.-Cu.	NNW	6.4	☉ a. ☉ p.
18.	59.98	25.3	27.8	23.8	85.2	20.4	N	299.6	9.2	Cl., A.-Cu.	N., S.-cu.	N quad.	2.8	☉ a. ☉ p.
19.	60.22	25.8	28.9	23.6	87.8	21.6	NW, N	281.6	9	Cl.	Variable	NE	13.5	☉ a. ☉ p.
20.	60.53	26.5	28.4	24.8	83.3	21.4	NE quad.	401	6.7	A.-Cu.	NE	NE	15.7	☉ a. ☉ p.
21.	60	27.1	29.9	24.8	78.7	21	NE	377.4	5.5	Cl.	S.-Cu.	NNE		☉ a. ☉ p.
22.	59.05	25.9	29.6	22.1	86.5	21.3	W	201.5	4.8	Cl.-S.	Cu.	N	6.1	☉ a. ☉ p.
23.	59.30	26.6	28.4	23	81.3	20.9	NE	719.3	7.2	Cl.-S.	S.-Cu.	N quad.	1.8	☉ a. ☉ p.
24.	60.64	26.8	28.4	24.9	72.2	18.8	N	811.8	4.7	Cl.	S.-Cu.	NNE		☉ a. ☉ p.
25.	61.12	26.7	28.3	22.2	68.3	17.8	NE	526.2	6.8	Cl.-S.	S.-Cu.	NE quad.		☉ a. ☉ p.
26.	60.06	26	29	20.3	70.5	17.4	N quad.	489.6	2	Cl.	Cu.	NE		☉ a. ☉ p.
27.	59.85	26.5	29.5	21.8	78.2	20	NE quad.	389.2	3	Cl., A.-Cu.	S.-Cu., Cu.	NE		☉ a. ☉ p.
28.	61.08	25.5	26.9	24	83.3	20.2	NE	579.8	8.7	Cl.-S.	S.-Cu., N.	NE	56.2	☉ a. ☉ p.
29.	61.05	26.7	27.8	24.8	80.5	21	N	655.6	6.5	Cl.	S.-Cu.	N quad.	2.3	☉ a. ☉ p.
30.	60.58	27.1	29.2	25.7	79.3	21.1	N	555.5	6.2	A.-Cu.	S.-Cu.	NNE		☉ a. ☉ p.
31.	60.12	26.6	28.4	24.8	84.7	21.9	NE	289.9	8.7	Cl.-S.	S.-Cu.	NE	2.3	☉ d p.
Mean	758.32	26.2	28.7	23.5	83.5	21		383.5	7.1					
Total												364		

\* The maximum temperature records from October 2-7 are taken from the self-registering apparatus.

## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5<sup>a</sup> meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	P. ct.			mm.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
												Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.		
1.	758.11	27.5	35	23.4	86.2	23.4	NE	1	6	Ci.-S.	Cu.	E	7.4	☉ a. ● p.	
2.	57.84	28.1	35.1	24	81.8	22.9	E	1	7.5	Ci.-S.	Cu., S.-Cu.	E	4.3	☉ a. ● p.	
3.	57.97	26.8	32	23	85.2	22.3	NE	1	6.3	Ci.-S.	Cu.	E	2	☉ a. ● p.	
4.	58.66	26.6	31.8	23	80.8	20.9	NE	1	6.7	Ci.-S.	Cu.-N.	E	17.3	☉ a. ● p.	
5.	58.39	25.7	31.3	22	83.7	20.3	NE	1	6.7	Ci.-S.	Cu.	E	8	☉ a. ● p.	
6.	58.02	26.1	30.3	23.2	84	20.9	NE	1.3	7.7	Ci.-S.	Cu.	E	8	☉ a. ● p.	
7.	58.56	26.3	32.2	22.3	86.2	21.8	NE	1.2	5.7	Ci.-S.	Cu.	E	8	☉ a. ● p.	
8.	58.39	27	33.2	22	83	21.6	E	1	5.7	Ci.-S.	Cu.	E	8	☉ a. ● p.	
9.	56.98	27.1	33.1	22	80.2	20.8	E	1	7.7	Ci.-S.	Cu.	E	1.8	☉ a. ● p.	
10.	55.92	26.7	33	23	82.5	21.3	E	1.2	7.3	Ci.-S.	Cu.	NE	1.5	☉ a. ● p.	
11.	54.74	24.7	27.3	22.5	93	21.6	NE	1.2	9	Ci.-S.	NW	W	5.4	☉ a. ● p.	
12.	53.42	25.6	29	22.3	89.2	21.7	NE	1.5	9.7	Ci.-S.	N.	NNE	5.6	☉ a. ● p.	
13.	51.83	26.7	29	24	90.5	23.5	SW	3	10	Ci.-S.	S., N. NNW, W	W	61.7	☉ a. ● p.	
14.	52.03	25.8	27.1	24.5	92.2	22.7	SW	3.3	10	Ci.-S.	N.	W	66.8	☉ a. ● p.	
15.	54.78	27.3	31.8	23.5	84.5	22.6	NE	2.5	8.5	Ci.-S.	S.-Cu.	SW	9.9	☉ a. ● p.	
16.	57.85	25.5	30	23.1	90.5	21.8	NE	1.2	6.3	Ci.-S.	Cu.	SW	2	☉ a. ● p.	
17.	58.71	26.6	34	22.4	82.3	20.8	NE	1.2	5.7	Ci.-S.	Cu.	E	2	☉ a. ● p.	
18.	59.44	26	33.4	21	84.2	20.8	E	1.2	6.3	Ci.-S.	Cu.	E	2	☉ a. ● p.	
19.	59.77	25.6	30.5	21.7	84.2	20.4	NE	1.5	7.8	Ci.-S.	S.-Cu.	SE	2	☉ a. ● p.	
20.	60.25	26.5	30.7	22.8	80	20.5	NE	1.3	6	Ci.-S.	S.-Cu.	SE	2	☉ a. ● p.	
21.	59.82	26.2	32.2	22.5	82	20.6	NE	1.5	6.2	Ci.-S.	Cu.	SE	2	☉ a. ● p.	
22.	58.78	27	33	21.8	83.5	22	E	1.5	6	Ci.-S.	ENE	SE	2	☉ a. ● p.	
23.	58.67	26.5	31	22.9	77.7	19.8	NE	1.3	7	Ci.-S.	SW	SE	2	☉ a. ● p.	
24.	59.65	25.9	31.2	21.6	76.2	18.7	NE	1.5	5.5	Ci.-S.	E	SE	2	☉ a. ● p.	
25.	60.54	25.3	31	20.6	76.7	18.2	NE	1.5	6	Ci.-S.	SW	SE	2	☉ a. ● p.	
26.	59.80	24.7	31	18.6	75	17.1	NE	1.2	4	Ci.-S.	Cu.	SE	2	☉ a. ● p.	
27.	59.52	25.7	31.5	20.6	75.7	18.4	NE	1.2	5.2	Ci.-S.	Cu.	SE	2	☉ a. ● p.	
28.	60.32	26.4	30.4	22.5	76.5	19.4	NE	2.3	7.5	Ci.-S.	NNE	SE	2	☉ a. ● p.	
29.	60.50	26.8	31	23.8	71.2	18.5	NE, E	2.2	5.8	Ci.-S.	Cu., S.-Cu.	SE	2	☉ a. ● p.	
30.	59.98	27.3	32.3	22.1	73.2	19.6	NE	1.5	5.8	Ci.-S.	Cu.	SE	2	☉ a. ● p.	
31.	59.73	26.6	31	23.7	80.8	20.8	NE	2.2	8	Ci.-S.	Cu., S.-Cu.	SE	2	☉ a. ● p.	
Mean	758.03	26.3	31.5	22.5	82.3	20.8		1.5	6.9						
Total													187.5		

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total move- ment in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P.ct.	mm.		Km.	0-10.			mm.	
1.	758.60	27.2	31.6	23.3	85.5	22.6	NE	109	3.2	Ci.	Cu.	N, NE	○ a. ∠ p.
2.	58.19	27.4	32	24	86.5	23.3	NE	111.3	4.3	Ci.	Cu.	NE	○ d° a.
3.	58.64	26.4	29.6	23.9	87.8	22.2	NE	94.7	8	Ci., Ci.-S.	Cu.	NE	● a. ● p.
4.	59.22	25.5	29.2	23.5	92.2	22.2	Calm	73.7	7.8	Ci.-S.	Cu.	N, NE	● a. ∠ p.
5.	58.75	25	30.1	22.9	92.7	21.9	Calm	93.2	9.2	Ci.-S.	Cu., S.-Cu.	NE	● a. ∠ p.
6.	58.55	25.8	30.6	23.5	89.5	21.9	ENE	120	10	Ci.-S.	Cu.	NE	● d a. ∠ p.
7.	59.23	26.4	32	22.8	86.3	21.8	NNE	100.7	5	Ci., A.-Cu.	Cu.	NE	○ a. ∠ p.
8.	59.02	26.5	30.8	23	85.8	21.8	NNE	115.6	4.5	Ci.	Cu.	NE	○ a. ∠ p.
9.	57.34	25.9	31.1	23.2	91	22.5	NE	140.5	9	Ci.-S.	Cu.	NNE	○ a. p.
10.	55.81	25.6	27.1	24.4	91	22.1	N	179.9	10	Ci.-S.	S.-Cu. N, NNW	129.6	○ a. p.
11.	52.65	25.5	26.5	23.8	94.2	22.8	N quad.	340.7	10	Ci.-S.	S.-Cu.	N	168.2
12.	51.95	24.1	26.2	23.2	94.7	21.1	WSW	425.7	10		N.	WSW	177.3
13.	51.42	26.7	30.3	23.5	85.3	22.1	SW	364.4	10	Ci.-S.	S.-Cu.	WSW	○ a. p.
14.	51.99	27.7	30.1	25.9	76.3	21.1	SSW	433.2	10	Ci.-S.	Cu.	SSW, SW	○ a. ∠ p.
15.	54.27	27.1	30.9	24.6	85.5	22.8	SW		9.7	Ci.-S.	Cu.	SW	○ a. ∠ p.
16.	57.94	26.1	31.6	22.9	88.3	22	SW	110.6	7	Ci.	Cu.	WSW	○ a. ∠ p.
17.	59.09	25.2	27.6	22.4	89.7	21.4	NNE	201.3	8	Ci.-S.	Cu.	N	○ a. p.
18.	60.04	25.4	28.6	23.3	90.3	21.7	E, NE	130.4	10	Ci.-S.	Cu., S.-Cu.	NE	○ a. p.
19.	60.52	25.8	30.2	23	89.2	21.9	E	106.5	8	Ci.-S.	Cu.	ENE	○ a. p. ∠ p.
20.	60.75	26.5	31.2	23	85.2	21.6	E	172.5	5	Ci.	Cu.	E, NE	○ a.
21.	60.37	26	31	22.9	83.7	20.6	NE, NNE	124.9	4	Ci.	Cu.	NE	○ a.
22.	59.27	26.1	31	21.8	85	21.2	Variable	130.1	7.5	Ci., Ci.-S.	Cu.	NE	○ a. d° ∠ p.
23.	59.53	26.6	29	24.5	82.8	21.4	NNE	348.4	8.8	Ci.-S.	Cu., S.-Cu.	N	○ a. p.
24.	60.74	27.3	29.9	25.9	68.3	18.4	N	342.3	8.2	Ci., Ci.-S.	Cu.	N	○ a. p.
25.	61.41	26.3	29	21.4	70.5	17.8	N	226.2	6.5	Ci.	Cu.	N	○ a.
26.	60.17	24.7	29.1	19.5	81.7	18.8	N	167.4	6	Ci., Ci.-S.	Cu.	N	○ a.
27.	60.02	25.4	30.3	21.4	84.5	20.1	N	156.7	6.5	Ci.	Cu.	N	○ a.
28.	61.29	25.9	27.3	22.1	83.3	20.5	NNE	337.2	10	Ci.-S.	S.-Cu.	NNE	○ a. p.
29.	61.28	26.8	30.8	24.1	79	20.7	NE	288.3	8	Ci.-S.	Cu.	NE	○ a. p.
30.	60.73	26.6	29.7	25.5	86	22.3	NE	189.2	6.5	Ci.	Cu.	NE	○ a. p.
31.	60.44	26.2	29.8	24	88.8	22.3	ENE	128.3	9	Ci.-S.	Cu.	E	○ a. p. d° p.
Mean	758.36	26.1	29.8	23.3	85.8	21.4		195.4	7.7				
Total													782.9

<sup>a</sup> This is an approximate height of the barometer above sea level.

## Meteorological data for first and second class stations—Continued.

## SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied, -1.69 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	mm.	°C.	°C.	°C.	P. ct.	mm.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
										Upper.	Lower.	
1.	758.68	28	33.9	24.6	85	23.5	NE	0-12.	0-10.	Ci.	Cu.	E
2.	58.35	*28.1	34	23.7	*86.8	*24.1	SSW, SE	1.5	5.8	Ci.	Cu.-N.	E
3.	58.68						ESE	2	5.8	Ci.-S.	Cu.-N.	E
4.	59.08	27.3	31.4	23.8	77.2	20.5	NE	1.7	5.8	Ci.	Cu.-N.	E
5.	58.94	26.2	31.4	23.8	87.2	22	S	1.5	7.2	Ci., Ci.-S.	Cu.-N.	E
6.	58.62	27.1	31.6	23.4	81.8	21.5	NE	1.7	6.3	Ci.-S., Ci.	Cu.-N.	E
7.	59.11	27.6	33	23.4	80.3	21.6	N, NE	1.5	5.7	Ci.	Cu.-N.	E
8.	58.99	27.1	32.6	23.1	81.3	21.2	NE, NW	1.7	5	Ci.	Cu.-N.	E
9.	57.70	26.6	33	22.5	83.3	21.2	N	2.2	6.2	Ci.	Cu. NE quad.	E
10.	56.50	26.6	31.9	23.4	86	22	NW	2	6.7	Ci.-S.	Cu.-N. NNE, NW	E
11.	55.50	25.4	26.9	24.1	93	22.4	W	1.5	10	Ci.-S.	N. WNW	E
12.	54.20	24.8	28	22.8	92.2	21.4	W	1.7	9.8	Ci.-S.	N. W	E
13.	51.66	25	29.9	22.9	95	22.3	SSW	2.3	10	Ci.-S.	N. SW	E
14.	51.96	25.4	28.4	23.8	93	22.4	SSW	3.8	9.8	Ci.-S.	N. SSW, SW	E
15.	54.90	26.7	30.8	23.7	86.5	22.2	W	2.8	7.7	Ci.	Cu. WNW	E
16.	58.14	26.2	31	23.4	88	22	W	1.7	8.2	Ci.-S.	Cu. WNW	E
17.	59.24	26.2	30.6	22.4	83.5	20.8	WSW	1.5	5.7	Ci.	Cu. W, E	E
18.	59.94	26.5	31	22.9	81.8	20.8	NE	2	5.2	Ci.	Cu. SSE	E
19.	60.32	26.4	30.1	23.1	81.8	20.7	NE	2.3	6	Ci.	Cu. E	E
20.	60.62	26.7	31.4	22.9	79.3	20.3	NE	1.7	4.7	Ci.	Cu. E	E
21.	60.14	26.4	31.4	22.5	83.2	21	N	1.7	4	Ci.	Cu.-N. NE	E
22.	59.28	26.6	31.8	22.9	85.2	21.8	Variable	1.5	6.5	Ci.	Cu. NE	E
23.	59.23	26	31.2	22.6	82.8	20.6	NE, E	2	4.7	Ci.	Cu. E, NE	E
24.	60.45	25.9	31	21.6	74.2	17.8	N	2.5	5.3	Ci.	Cu. N	E
25.	61.09	25.2	30.2	21.4	75.8	17.8	NE	2.5	4.3	Ci.	Cu. NE, NNW	E
26.	60.37	25	31	19.4	74.5	17	NE	2	2.8	Ci.	Cu. ENE, NE	E
27.	60.26	24.8	30.9	19.3	78.7	18	N	2.2	2.7	Ci.	Cu. E	E
28.	61.04	25.6	30.5	21	78	18.7	N	2.5	3.3	Ci.	Cu. E	E
29.	61.38	26.1	31.4	21.4	77.7	19.2	NE	2.2	2.7	Ci.	Cu. E	E
30.	60.76	26.5	32.1	21.6	78.3	19.8	NE	1.3	1.7	Ci.	Cu. E	E
31.	60.55	24.6	29.7	21.4	89	20.4	N	1.5	6.3	Ci.-S.	Cu., Cu.-N.	E
Mean	758.57	26.2	31.1	22.6	83.3	20.8		2	5.9			
Total												177.5

## DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied, -1.67 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	mm.	°C.	°C.	°C.	P. ct.	mm.	Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
										Upper.	Lower.	
1.	757.89	28.8	33.3	25	78.2	22.7	NW, NE	156	3.2	Ci.	Cu.	ESE
2.	57.64	28.1	35	25	83	23.2	Variable	204.3	8	Ci.-S.	S.-Cu.	SE
3.	57.77	27.9	34.9	24.8	84	23.2	SE	195.3	8.3	Ci.-S.	Variable	
4.	58.36	27.5	34.1	24.1	81.2	21.9	SE	207.9	7.7	Ci., Ci.-S.	S.-Cu.	S
5.	58.21	26.9	32.7	24	85.2	22.2	Variable	126.3	8	Ci.-S.	S.-Cu., N.	
6.	57.82	27.5	32.8	23.5	81.7	22	N quad.	152.3	4.7	Ci.	S.-Cu.	
7.	58.46	27.7	33.1	24.1	80.5	22	N quad.	151.5	4.3	Ci.	Cu.	
8.	58.29	27.7	33.4	23.6	79	21.5	Variable	147.9	2.3	Ci.	Cu.	
9.	56.78	27.7	33.4	23.1	79.5	21.7	NNW	161.5	4.8	Ci.-S.	Cu.	
10.	55.74	28.2	33.7	23.9	80.7	22.5	NW	148	7.7	Ci.-S.	S.	
11.	54.57	27.2	32	25	86.8	23	S quad.	107.3	9.5	A.-S.	S.-Cu.	SE
12.	53.30	27	31.3	24.1	86.2	22.9	Variable	189.7	10	A.-S.	S.-Cu., Fr.-N.	
13.	50.68	25.6	31.3	23.9	93	22.7	SE	165	9.8	A.-S.	N. WSW	
14.	50.68	27.5	31.8	23.9	83.2	22.5	NW	376.5	9.8	A.-S.	N. WNW, N	
15.	54.20	28.1	30.8	26.6	78.2	22.1	NW	505.6	8.7	Ci.-S.	Fr.-N. NNW	
16.	57.46	26.6	30.6	25.1	77.3	21.2	NNW	318	5.3	Ci.	S.-Cu., Cu.	
17.	58.58	26.6	30.9	22.1	73.8	18.8	N, NW	197.5	3.8	Ci.	Cu.	
18.	59.06	27.2	33.7	23	77.8	20.6	SE	174.5	4.7	Ci.	Cu.-N.	SSW
19.	59.35	27.2	33.8	23.1	79.8	21	SE	197.9	6.2	A.-Cu.	Cu.	
20.	59.96	27.2	33.5	23.1	79.2	20.9	SE, nbyw	162.1	5	Ci.	Cu.	
21.	59.58	27.4	31.9	23.5	79.2	21.2	NW	150.8	2.2	Ci.	Cu.	
22.	58.56	27.7	33.3	23.6	79.2	21.6	N quad.	181.3	3.8	Ci.	Cu.	
23.	58.31	27.8	34	23.5	76.8	20.9	Variable	170.5	7.2	Ci.-S.	Cu., S.-Cu.	
24.	59.46	26.9	32.3	23.1	69.3	18.1	S quad.	217.9	5	Ci.	S.-Cu.	
25.	60.24	26.3	32.4	21.4	72.8	18.3	SE	177.9	3	Ci.	Cu.	
26.	59.64	25.4	32.4	20.6	70.7	16.5	SE	164.3	4	A.-Cu.	Cu.	
27.	59.60	25.8	31.6	20.2	76.7	18.6	NW, N	164.8	4.5	A.-Cu.	Cu.	
28.	60.20	26.2	32.6	21.5	77	19	S quad.	180.8	1	Ci.	Cu.	
29.	60.61	26.8	33.1	22	72.8	18.8	SE, NNW	204.2	.2	Ci.	Cu.	
30.	60	26.8	32.9	21.9	75.8	19.4	S quad.	172.3	.2	Ci.	Cu.	
31.	59.50	26.9	32.9	22.1	77.5	20.2	SE quad.	198.8	4.5	Ci.	Fr.-N. ESE	
Mean	757.76	27.2	32.7	23.4	79.2	21		194.5	5.4			
Total								6,028.7				112.1

\* Mean deduced from four observations only.

## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied, -1.65 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	mm.	°C.	°C.	°C.	P. ct.	mm.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.		
										Upper.	Lower.	
1.	758.19	28.7	33.6	24.3	79.8	23.2	WNW	2.7	4.5	Cl.-S.	Cu.	2.5
2.	57.84	28.7	32	24.8	80.3	23.3	Variable	2.8	8.5	Cl.-S.	Cu.	8
3.	57.87	27.4	33	25.3	82.2	22.2	SSE, S	3.5	9.2	Cl.-S.	Fr.-Cu. SSE	8
4.	58.59	26.7	33	24	85	22	SSE, W	2.7	9.5	Cl.-S.	Cu.	8
5.	58.45	27.3	32.5	24.2	81.7	21.8	S	2.8	10	Cl.-S.	Cu.-N.	8
6.	58.05	27.8	33	23.6	79.7	22	SE quad.	2.3	5.8	Cl.-S.	Cu.	8
7.	58.69	27.4	33	23.4	82.3	22.1	SE quad.	2.2	5.5	Cl.-S.	Cu.	8
8.	58.57	27.6	33.1	23.9	81.7	22.2	SSE	2	5.5	Cl.-S.	Fr.-Cu. SSE	8
9.	57.08	27.9	33.7	23.9	80.2	22.2	SE quad.	3	10	Cl.-S.	Cu.	8
10.	56	28	32.9	24	81.3	22.6	NNW	2.7	9.5	Cl.-S.	Cu.	8
11.	54.81	27.4	33.1	24.1	82.8	22.3	Variable	1.8	10	Cl.-S.	S.-Cu.	8
12.	53.56	27.1	31	23.5	85	22.5	SSW	1.3	10	Cl.-S.	S.-Cu., N.-cf.	8
13.	50.82	29	33.3	25.5	77.2	22.8	NNW	3.3	10	Cl.-S.	N.-cf.	15.5
14.	51.33	28.3	32.1	26.5	80.5	22.8	NNE	4.5	10	Cl.-S.	Cu. NNE, N	8
15.	54.87	27.9	31	25.9	81.8	22.9	N	4.2	10	Cl.-S.	N.-cf.	10.9
16.	57.97	27.3	30.6	25.3	77.8	20.7	N	4	8.8	Cl.-S.	Fr.-Cu. NNE	8
17.	58.90	27.2	31.4	24.5	69.7	18.6	N	3	7.5	Cl.-S.	Cu.	8
18.	59.27	27.1	31.6	23.1	78.7	20.8	S	2.5	8.3	Cl.-Cu.	S.-Cu., Cu.	8
19.	59.68	26.2	31.4	23.9	85	21.3	S, SSE	1.8	9	Cl.-A.-Cu.	S.-Cu.	36.8
20.	60.14	27.2	31.8	23.3	81.5	21.6	SSE, N	2.7	6.8	Cl.-S.	S.-Cu.	8
21.	59.98	27.8	31.9	24.1	79.7	21.9	SSE, NNE	3	4.8	Cl.-S.	Cu.	8
22.	58.97	27.4	32	24	81.2	22	SSE, NNE	2.3	8	Cl.-S.	S.-Cu., Cu.	8
23.	58.66	27.7	31.6	23.6	78.3	21.4	NNE	3	10	Cl.-S.	S.-Cu.	8
24.	59.81	26.6	31.3	22.6	69.8	17.9	SSE	3.3	4.7	Cl.-S.	S.-Cu.	8
25.	60.46	26	31.1	22.1	73	18	SE quad.	2.8	8.3	Cl.-S.	S.-Cu.	8
26.	59.95	26	30.9	20.6	73	18	SE quad.	2.7	5.7	Cl.-S.	S.-Cu.	8
27.	59.92	26.2	31.5	20.7	77.2	19.3	N quad.	2.8	6.8	Cl.-S.	S.-Cu.	8
28.	60.58	26.1	31.5	21.5	75.2	18.6	S	2.5	7	Cl.-S.	S.-Cu.	8
29.	60.90	26.7	32.1	22.1	72.3	18.6	NNE	3.3	1.5	Cl.-S.	S.-Cu.	8
30.	60.29	25.8	31.6	20.8	78.5	19.3	S	2.2	1	Cl.-S.	S.-Cu.	8
31.	59.83	26.5	31.6	21.1	77.5	19.7	SSE	2.2	7.7	Cl.-S.	S.-Cu.	8
Mean	758.06	27.3	32.1	23.6	79	21.1		2.7	7.5			
Total												67.3

## BAGUIO.

[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied, -1.65 mm.]


















Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	mm.	°C.	°C.	°C.	P. ct.	mm.	Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
										Upper.	Lower.	
1.	636.81	18.9	23.9	16.1	91	14.7	WSW	236.7	6	Ci.	Cu.-N. SSE, WNW	4.1
2.	36.49	18.5	23.5	16.1	94	14.9	WSW	263	7.9	Ci.	Cu.-N. NW	6
3.	36.32	18.3	23	15.8	92.8	14.5	Variable	202.6	8.7	Ci.	N. NW	12.9
4.	36.96	17.3	22.3	15.5	94.7	13.9	WSW, SE	220.7	8.1	Ci.	Cu.-N. WSW	19.6
5.	36.60	17.4	22.8	14.5	93	13.8	E quad.	237.4	9.4	Ci.	Cu.-N. N	37
6.	36.32	18.2	23.8	15.3	89.5	13.9	W quad.	233.8	6.4	Ci.	Cu.-N. S quad.	1.6
7.	36.84	18.5	23.5	15	89	14.1	SW quad.	244.6	6.6	Ci.	Cu. SSE	12
8.	36.81	18.8	24.8	15.2	88.7	14.3	SW quad.	230.1	6	Ci.	Cu. WSW	2.6
9.	35.71	18.7	24.3	15.3	86.3	13.8	Variable	260.3	5.9	Ci.	Cu. E	6.9
10.	34.88	18.8	23.7	15.7	88.7	14.2	Variable	249.3	6.4	Ci.-S.	Cu.-N. NE	1.9
11.	33.84	17.9	21.8	16	89.3	13.6	Variable	191.5	9.9	Ci.-S.	S.-Cu. NE	2.5
12.	32.63	18	25	15.7	90.3	13.8	W quad.	224.1	9.9	A.-Cu.	Cu.-N. NE quad.	7.6
13.	30.35	18	21.8	16.5	96.2	14.8	WSW	240.9	9.9	A.-Cu.	Cu.-N. N	1.8
14.	30.19	17.9	22	16.2	94.8	14.4	N quad.	322.2	9.9	Ci.	N. NW	2.9
15.	33.07	17.2	22	15.5	91.3	13.2	NW quad.	451	8.3	Ci.	Cu.-N. NNW	4.4
16.	35.63	16.3	20.8	14.5	91.5	12.7	WSW, N	368.1	8.3	Ci.-S.	Cu.-N. WSW	11.2
17.	36.33	16.7	21.8	13.3	83.7	11.9	WSW	241.7	2.7	Ci.	Cu.-N. SSE, W	6.5
18.	37	17.8	23.2	14.3	89.5	13.5	WSW, SE	284.2	5.7	Ci.	Cu.-N. sw quad.	1.5
19.	37.35	17.9	22.8	15.2	89.8	13.7	SW, SE	251.4	6.7	Ci., A.-Cu.	Cu.-N. SSE, S	4.4
20.	37.98	17.6	22.3	15	94	14.1	Variable	210.1	7.7	Ci.	Cu.-N.	6.5
21.	37.72	17.8	22.8	15.4	89.5	13.6	WSW, SE	221.5	5.6	Ci.	Cu.	1.5
22.	36.92	18.1	23.3	15.2	90	13.8	Variable	223.9	7.9	Ci.	Cu.-N.	3
23.	36.70	17.4	22.8	14.5	88.7	13.1	SW, E	260.2	7.6	Ci.-S.	Cu.-N. ENE	3
24.	37.22	17.2	22.4	14.1	82.8	12.7	E	308.7	4.7	Ci.	Cu.-N. WNW	3
25.	37.62	16.4	21.9	13	90.3	12.4	SW quad.	234	7.3	Ci.	Cu. NW	3
26.	37.03	15.4	21.8	11.3	85.5	11	NE, SE	212.1	4.7	Ci.	Cu. SE	3
27.	37.11	15.3	21.5	12	90.5	11.8	NE, SW	278.2	7.1	Ci.	Cu.-N. SE, E	3
28.	37.88	16.3	22.4	12.8	86.3	11.9	SW, E	318.7	5.7	Ci.	Cu.-N. SSE, W	1
29.	38.30	16.8	22.6	13.8	83.5	11.9	SW, E	304.6	4.3	Ci.	Cu. ESE	3
30.	38.01	17.5	22.9	14.3	84.8	12.6	Variable	285.9	3.6	Ci.	Cu.	3
31.	37.82	18.6	25.3	14.7	81	12.7	E quad.	427.8	5.9	Ci.	Cu.-N. S	3
Mean	636.14	17.6	22.9	14.8	89.4	13.4		265.8	6.9			
Total								8,239.3				139.2

\*The barometric readings of this station are not reduced to sea level.

*Meteorological data for first and second class stations—Continued.*

**VIGAN,**

[ $\phi=17^{\circ} 34' N$ ;  $\lambda=120^{\circ} 23' E$ ; barometer above sea, 12.2 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.	
1.	758.16	28.1	32.4	24.4	81.8	22.8	NW	142.6	2.3	Ci.-S.		Cu.	WNW		 p.
2.	757.78	27.9	32.3	24.7	81.5	22.7	NW quad.	144.5	3	Ci.-S.	NE	Cu.	WNW		 p.
3.	57.77	28.3	33.5	24.3	78.8	22.2	Variable	128.6	2.8	Ci.-S.		Cu.	WNW		 p.
4.	58.69	27.4	31.2	24.6	81.3	22.1	Variable	141.6	5.7	Ci.-S.	SW	Cu.	WNW	8.6	 p.
5.	58.34	27.5	31.2	24.1	81.2	22.2	NW quad.	133.1	6	Ci.-S.		Cu.			
6.	58.09	27.4	32.6	23.6	80.5	21.6	NW quad.	148.4	2	Ci.-S.		Cu.	NW		
7.	58.59	27.7	32	24.1	85.5	23.6	NW quad.	155.4	2	Ci.-S.		Cu.	NNW, NW		
8.	58.51	27.8	32.6	24.1	85.7	23.8	Variable	153.1	1.8	Ci.-S.		Cu.	NW		
9.	56.99	27.8	31.5	24.1	86.2	23.8	NW, SW	144.7	5.2	Ci.-S.	E	Cu.	NW		
10.	55.96	28.2	32.4	24.7	82.2	23.2	Variable	140.1	6.2	Ci.-S.	SE	Cu.	NNE, NNW		 p.
11.	54.81	27.6	32.3	24.2	77.7	21	NNW	134.8	9.7	A.-Cu.	NNW	Cu.	NE, NW		 a. p.
12.	53.60	27.2	32.3	24.2	85.5	22.8	W quad.	93.4	10	A.-Cu.	NE	Cu.	N quad.	7.4	 p.
13.	50.89	26.3	31.2	23.7	89.8	22.9	NNW	277.4	10	A.-Cu.		Cu.-N.	NNE	7.4	 d p.
14.	51.46	25.4	28.9	23.3	93.2	22.5	NNW	294.7	9.8	A.-Cu.		Cu.-N.	NE	3.3	 d a. p.
15.	54.88	25.6	28.6	23.7	96.5	23.4	NNW	260.7	9	A.-Cu.	NNW	Cu.-N.	N quad.	12.5	 a. p.
16.	58.10	24.8	28.4	22.1	93.7	21.7	NNW	305.6	7	A.-Cu.	SW	Cu.-N.	N quad.	9.7	 d a. p.
17.	58.84	25.1	29.3	20.3	82.5	19.3	NNW	115.4	1.2	A.-Cu.	SW	Cu.	SSW	4.1	 d a.
18.	59.38	26.6	30.6	23.2	81.2	21	SE	142.5	5.8	A.-Cu.	SW	Cu.	SSW		
19.	59.79	27.1	32	23.8	82.2	21.8	ESE, NW	147.2	7.5	A.-Cu.		S.-Cu.	SSW		d° p.
20.	60.28	27.3	30.5	24.8	85.7	23.1	NW	167.5	5.3	A.-Cu.		Cu.	NE, NW		
21.	59.76	26.8	31.5	23.4	88.8	23.2	NW	156.5	1.8			Cu.			
22.	58.94	26.8	31.3	23.4	87.2	22.8	NNW	217	2.2	Ci.		Cu.	NNW		d° p.
23.	58.96	26.7	32.1	22.8	76.3	19.6	ENE	280.1	5.7	A.-Cu. nw, wsw		S.-Cu.			
24.	59.96	25.5	30.2	21.9	76.7	18.4	NNW	232.7	.3	Ci.		Fr.-Cu.			
25.	60.71	24.8	29.9	20.1	76.7	17.6	NNW	176.6	.8	Ci.		Cu.			 a.
26.	59.95	24.8	29.7	20.2	79.3	18.6	NNW	242.1	1.5	Ci.		S.-Cu.			 a.
27.	60.01	24.9	30.3	19.8	82.2	19.1	NNW	253.3	2.3	A.-Cu.	ESE	Cu.	SE		 a.
28.	60.72	25.3	30.4	21.1	83.8	19.9	NNW	164.4	2.5	Ci.		Cu.	SE		 a.
29.	60.96	25.9	30.3	21.5	78.2	19.1	NW, NNW	120.3	.8	Ci.-S.		Cu.			 a.
30.	60.28	26.2	31.9	20.7	80.7	20.1	Variable	123.7	1	Ci.-S.		Cu.	NW		
31.	59.92	27	31.2	22.8	84	22.1	Variable	111	2.5	Ci.-S.		S.-Cu.	NE		
Mean	758.10	26.6	31.1	23	83.4	21.5		176.1	4.3						
Total								5,459						45.6	

**TUGUEGARAO.**

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its directions.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.	
1.	758.67	27.8	35.1	23.2	81.2	22.1	NW quad.	0.7	5.3	Ci., Ci.-S.	Cu. S, N	—	☼ p.
2.	58.43	27.3	34.4	23.3	83	22	NW	1.2	6.2	Cl., Cl.-S.	S.-Cu., Cu.-N, N	—	☼ ☽ p.
3.	58.66	27.1	34	23.5	82.2	21.6	NW	.8	5.3	A.-Cu., Ci.	S.-Cu. SW, N	—	☼ a. d a. ☽ p.
4.	59.80	25.1	30.3	22	87.3	20.6	N, NW	.3	8.3	Ci.-Cu.	N., Cu.-N, N	11.7	● ☼ a. d a. p. T p.
5.	59.49	25.8	31.8	22.5	85.3	20.8	NW	.7	8.7	A.-Cu.	Cu.-N. NE	—	● d a. ☽ p.
6.	58.87	26	32.5	21	83	20.5	Variable	.5	5.5	Ci.	Cu. N	—	☼ a.
7.	59.33	26.5	33.5	21.8	81.2	20.5	NW	.5	2.7	Cl., Ci.-S.	Cu. N	—	☼ a. ☽ p.
8.	59.31	26.8	34.8	22.4	82.8	21.4	NW	.5	5.7	Ci.	Cu. N	—	☼ p.
9.	58.08	25.7	29.7	23.3	90.3	22.1	NE quad.	.8	8.3	Ci.-S.	Cu.-N. NE	2	d a. p. T p.
10.	57.31	25.5	29.5	22.5	87.5	21.2	NW	.7	8.7	Ci.-S.	Cu.-N. N	—	☼ p.
11.	56.53	24.2	26.5	22.6	94.7	21.2	NW quad.	.7	10	—	N. N	17.8	● d a. p.
12.	54.39	24.5	27.5	22.5	95	21.7	NW	.5	10	—	N. N	37.3	d ● a. p.
13.	50.95	24.3	26.1	23.1	96.8	21.9	NW	3.2	10	—	N. N	114.4	● a. p. ☼ ° p.
14.	50.02	23.5	25.5	22	97.2	20.9	NW	3.5	10	—	N. N	96.2	● a. d p p.
15.	54.29	24.9	30.2	22	90.8	21.2	NW	1.5	9.3	Ci.	Cu.-N. N	2.5	● a. d p p.
16.	58.44	24.3	29	22	90.7	20.4	N quad.	.3	8.5	A.-Cu.	Cu.-N. N	1.3	p p p.
17.	59.81	24.1	30.4	21	84.5	18.7	N	.3	8.8	A.-Cu.	Cu.-N. Variable W, SE	1	d a. p p.
18.	60.70	24.4	30	21.1	83.7	18.9	Calm	0	6.8	—	Cu.-N. S	—	d ° p.
19.	60.79	25	30.1	21.8	84.5	19.8	NE	.2	8.7	—	Cu.-N. S	—	● p.
20.	61.02	25.8	33.1	22.2	85.8	20.9	SSE, SW	.3	7	A.-Cu.	S.-Cu., Cu. S	10.4	d a.
21.	60.75	26	32	23	86.5	21.4	NW	.5	3.3	—	Cu.-N. N	—	p a. ☽ p.
22.	59.89	25.5	30.5	22.2	86.3	20.8	NW	1.7	8.2	—	Cu.-N. N	5.6	☼ a.
23.	60.86	24.4	28	21.3	84.5	19.1	NW, NE	2	9.2	—	Cu.-N. N	—	☼ a.
24.	61.90	23.3	29	19.2	80	16.9	NW, NE	1.5	6.8	—	S.-Cu. NE	—	d p.
25.	62.26	23.5	29.2	19	81	17.2	N quad.	1.2	7.5	Ci.-S.	S.-Cu. NE	—	p a.
26.	61.14	23.6	29.1	19.3	87.2	18.6	NW	1	6.7	Ci.-S.	S.-Cu. N	—	—
27.	61.22	23.5	28.8	21.2	87.5	18.8	Variable	1.3	8.3	A.-S.	Cu.-N. N	1.5	—
28.	62.27	24.4	29.6	20.8	79.8	17.8	N quad.	.2	6.2	A.-Cu., Ci.	Cu. NW, N	—	—
29.	62.46	24.1	31.3	19.4	84.8	18.7	NE	.7	3.7	A.-Cu.	Cu. N	—	☼ a.
30.	61.42	25.3	33.5	19.9	81.8	19.4	SW	.7	3.7	—	Cu. S, SW	—	—
31.	60.98	26	33	22.5	87.3	21.6	SE	.2	7.5	Ci.-S.	Cu.-N. SE	—	≡ a. T d ☽ p.
Mean	759.03	25.1	30.6	21.7	86.3	20.3	—	1	7.3	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	301.7	—



Meteorological data for first and second class stations—Continued.

APARRI.

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied, -1.57 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.	
1.	758.84	27.6	31.6	23.4	81	22	NE	208.9	3	Ci.	E	Cu.-N.	NE	5.3	● a.
2.	58.48	27.2	31.4	23.8	83.7	22.4	NE quad.	222.3	4.3	Ci.-S.	NE	Cu.-N.	N	4.3	● a. < p.
3.	58.80	27.2	31.4	23.6	78.5	21	ENE	253.8	4.7	Ci.-S.	NE	Cu.-N.	ENE	4.3	● a. < p.
4.	59.77	26.2	31.4	23.2	85	21.4	Variable	318.6	8.3	Ci.-S.		Cu.-N.	NE	22.4	● a. ● a. p.
5.	59.70	27	30.5	24	72	19	ENE, E	344	4.2	A.-Cu.	W	S.-Cu.	E		● a.
6.	58.90	26	31	22	82.3	20.4	Variable	211.8	.3			Cu.-N., Cu.			● a.
7.	59.41	26.4	30.9	22.6	82.8	21	NE	218.2	.5			Cu.			● a.
8.	59.33	26.7	31.2	22.6	81.5	21.1	Variable	213.4	.3			Cu.	E	.5	● a.
9.	58.22	26.6	31.5	24.1	85.8	22.2	NE quad.	162.1	8.2	Ci.-S.		Cu.-N.	E	4.1	● a.
10.	57.30	26	28.1	23.5	89.7	22.3	Variable	139.1	7.8	Ci.-S.	SE	S.-Cu.	E	19	● a. p.
11.	56.52	24.2	25.9	23	91.5	20.6	W quad.	186.3	10			N.	NW, E	80.4	● a. p. ☐ ☐ p.
12.	54.61	24.7	26.7	22.9	94.5	21.8	N quad.	374.8	10			N.	NE quad.	94.7	● a. p.
13.	51.98	25.5	27.4	23.1?	91.7	22.2	N	565.4	10			N.	NE	75.8	● a. ● p.
14.	50.41	25	26.4	22.6	90.7	21.4	N quad.	849.3	10			N.	NNE, N	130	● a. p.
15.	54.01	25.7	28.3	22.9	86.3	21.2	NW	567.2	9.3	A.-Cu.	N	Cu.-N., S.-Cu.	N	18.8	● a. p.
16.	58.59	23.6	26	21.7	89	19.3	Variable	187.5	8.3	A.-Cu.	SW	S.-Cu., N.	NE	2.1	● a. p.
17.	59.90	24.2	28	20.6	78.2	17.4	E	225.8	3.8	A.-Cu.	E	S.-Cu.	ESE		● a.
18.	60.66	24.8	28.9	21.8	77.2	17.9	E	262.8	7	A.-Cu.	SE	S.-Cu.	SE		● a.
19.	60.90	25.6	29.5	22	78.7	18.9	Variable	254.8	6.2	A.-Cu.	SW	S.-Cu.	E		● a.
20.	61.13	25.8	29.9	22.5	81.8	20.1	Variable	278.6	5.2	A.-Cu.	WNW	S.-Cu.			● a.
21.	60.94	26	29.9	22.1	82.7	20.5	NE	184	.2			Cu.-N.		42.2	● a.
22.	60.18	26.2	29	22.8	82.8	20.9	NE	365.8	9.5	A.-Cu.	SW	Cu.-N.	E, ENE	3	● a. ● p.
23.	61.20	25.5	28.4	23	73.5	17.8	NE	582.6	8.5	A.-Cu.	NE	S.-Cu.	NE	5.1	● p.
24.	62	25.1	28	21.8	70	16.6	NE	367.5	7.3			S.-Cu.	NE, ENE		● a.
25.	62.21	24.6	28.7	20.6	74.2	17	SW, NE	209.1	7.2	Ci.-S.	S	S.-Cu.	NE	4.1	● a.
26.	61.17	24.8	29.1	20.6	76.8	17.8	NE	348.5	7.5	A.-Cu.	SE	Cu.-N.	NE	1.5	● a.
27.	61.26	25.8	28.5	24.2	69.2	17.1	NE	501.9	9	A.-Cu.	N	Cu.-N., S.-Cu.	NE		● a.
28.	62.68	25.6	28.8	23.8	67.3	16.5	ENE, NE	397	6.5	A.-Cu.	W, S	S.-Cu.	ENE		● a.
29.	62.53	25.5	29.2	21.1	75.3	18.2	NE quad.	245.8	1.8	A.-Cu.	E	Cu.-N.	E	3.3	● a.
30.	61.39	24.2	27	21.2	88.8	20	Variable	233.7	8.2			Cu.-N.	W	5.1	● a.
31.	61.04	25.3	28.5	21.6	87.5	20.9	NE quad.	160.2	4.7	Ci.-S.	E	S.-Cu.			☐ ☐☐ a. < p.
Mean	759.16	25.6	29.1	22.5	81.6	19.9		311	6.2						
Total								9,640.8						521.7	

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, OCTOBER, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan				41.7		2.3	.5		27.7	16.5	1.8				0.5	0.3
Zamboanga										28.2	19	7.9		11.9	9.9	22.1
Davao			28.4	24.1		11.9		14.5	2	15.2	14	3.8	15.5		23.4	25.4
Cotabato		4.8			6.9	5.3	2	5.1	67	10.9	28.2	22.9			3.6	1.5
Cagayan, Misamis			50.8	22.4	10.2	6.4		30.2	2.5	81.6	6.6	2.8			4.6	
Dapitan			4.8	22.6		63.5			10.4	3.6	41.1	15.5			16.3	
Butuan					34.3			3.8	1.3		36.6	.5			.3	
Dumaguete						3.8	5.8		3.3	7.9	50.6	69.1	2.5	1	2.8	2.5
Yap, W. Carolines	18.6	4.9	1.5	48.3	32	7.9	3.6	31.5	36.8	2	18.5	1				
Maasin		29.5	40.1	9.7						32.8		15.2		9.9		
San José Buenavista		5.6						2.5		52.8	21.8	52	44	47.3		21.3
Cuyo	1	2.5	16.8	8.4	5.3	3.3	11.7	6.1			1.8	66.3	6.1	15.3	1	2.3
Borongan	23.1		.5	1	2.5					19.6	39.6	2.8		.3		
Masbate		10.4	22.6	1.5			1.8		7.2	23.6	62.2	16.8	6.9		2.1	3.8
Romblon	8.9	11.4	.8	29.5	1.8	8.6	51.8	26.4	3		28.2	9.6	56.4	51.6	1	
Batag	5.8	5.6			17		3.8		35.1	2.3	3	1.5	2.3			12.2
Gubat			7.1	5.3	2.5			14	1	21.1	43.7	42.1		7.1	11.6	19.3
Sumay, Guam	23.5	7	6.4		31.1	7	10.8		47	23.5	32.4	28	14.6		21.6	10.2
Calapan	.8			.5		40.6	7.1				1.1	2.8	27.7	43.7	.3	
Virac	9.7	14.8	5.8	23.6	1		7.9	.2	6.9	11.4	122.9	59.2	18	.8	3.5	11.9
Nueva Caceres			.5	33.5	2.3	4.5	.9	12.5	7.7	50.2	302.2	97.6	17.6	27.2	10.2	15
Batangas	4.8	3.3	2.3	6.6	29	19.8	.5		11.7	2.5	2	27.2	22.1	44.4	11.9	5.5
Silang		3		1	4.3						9.4	1.8	22.4	56.9		2.5
Santa Cruz, Laguna					13	1.1				3.3	14.2	71.1	55.1	60.7		
Antipolo	10.4	4.1	3.6		5.6	31.5	13	9.7		.5	9.4	10.9	29.5	68.8	2.3	
Iba					2.8	6	.8	2.8	.7		6.5	5.6	44.4	24.5	1.5	
Tarlac	1		15.5		1.3	12.4	1.3			11.9	1	19.6	7.4	17.2		
Baler	.3	13.5	14	1.8			12.7	.5	.1	3.3	10.7	19.9	19	21.3		8.6
San Fernando, Union			14.5									7.1			1.3	
Echagüe		6.6	14.7		3.5				.5		17.8	8.5	29.5	11.1	2.3	15
Candon					6.4				1.3			4.1			1.3	
Laoag											5.8		44	17.8	5.6	
Santo Domingo, Batanes	16.3	3.8	10.9					14.5	11.4	10.4	31.5	33.4	53.8	6.4		

Station.	Day of month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Isabela, Basilan			1.3		50.8	0.5	9.7	3	3	10.7	10.2	4.3	1			160.1	
Zamboanga			16.5		90.7	16.2		4.6	11.4		3.8	.8			9.6	280.3	
Davao			2.8	1.8	9.7	11.4						1	3.8	15.7		155.2	
Cotabato				16	9.1				21.1			12.4				163.9	
Cagayan, Misamis				10.4	28.7	56.4				.8	1.3	5.1		.5	78.8	340.2	
Dapitan	3.6			4.3	8.6	3.3			50.8	.3	3.3				1.8	294.6	
Butuan		14.7	7.5	28					75.7	13.5	3.8		1.5	19.3	12.7	355.3	
Dumaguete		.5		43.9	3.3				.3			1.3	8.9		.3	135.8	
Yap, W. Carolines	4.5	1.5								.8		5.7		27.4	29.7	227	
Maasin				12.4	41.9	26	3	18.3	49.2	1.1			10.2	2.8	.8	372.3	
San José Buenavista	12.2	9.4	12.2	46.4		25.4	5.6	33.8								312.7	
Cuyo	45.8	23.1	.8	15.8			19								.5	360	
Borongan	4.1	21.8	31.8	1.3		4.6	12.7								23.4	247.6	
Masbate	3	7.1	35.3	31.8	.3		7.9						1.3	52.6	59.5	288.2	
Romblon	2.6	3.8		.5									4.1	8.4	1	179.3	
Batag	19.3	9.4	56.1	2.5		.3						5.3	2.8	1	15.5	402	
Gubat	11.2	11.2	78.2	6.6	1.3	9.1	11.2					69.1	4	33.3	50.8	374.6	
Sumay, Guam	4.6		49.8		5.1							48.3	6.4	14.7	19.6	323.3	
Calapan	3.8	11.4	21	8.3		21.6		7	1.9				5.1		1.3	344.5	
Virac	2.8	30.2	16.3	.5				.5			154.9	17.1			10.1	362.1	
Nueva Caceres	.5	1.5	15		.8	12.2	.8			2.5	1.8	21.8	.8	3.6	30.5	389.4	
Batangas	6.4		7.5	1.3		.7	10.8					4.1		4.6	22	639.3	
Silang			11.9												2.3	207.8	
Santa Cruz, Laguna		1										.8			1.3	102.3	
Antipolo		.5	5.6	.5										.5		227.7	
Iba			.6		13.5	2	2.8				1.8				10	229.4	
Tarlac		24.4	1.3				9.7								1.6	107.5	
Baler	11.4	42.4	15.5	28.4	22.1										7.1	114.3	
San Fernando, Union		8.9	12.2													260.5	
Echagüe	4.3	5.8		7.4		.5				5.8	8.6		1.3		5.3	44	
Candon		13.7	2.5													148.5	
Laoag																29.3	
Santo Domingo, Batanes	3				19.1			3.8				1.6	6.8	15	27.1	73.2	
																268.8	

## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, OCTOBER, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Cagayan, Misamis.		Dapitan.		Butuan.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	31.3	21.9	30.6	22.6	29.4	22.9	31.7	22.3	31.9	22.8	31.1	22.5	33	22.4	30.1	24.2
2	31.8	21.4	30.3	22.6	29.5	22.5	31.8	22	30.8	22.8	31.6	22	33.2	22.4	29.7	24.3
3	30.7	22.1	32.1	22.1	30.5	22.8	32.2	23.2	30.8	22.7	32	22.2	34	23.2	30.6	23.2
4	30	22.3	31.6	22.3	30	23.8	32.5	22.5	30.6	22.7	30.7	23	32	22.7	30.6	23.7
5	30.3	20.9	32.6	22.5	30	23.2	31.9	22.6	33.3	21.3	30.9	21	32.2	23.2	29.3	23.6
6	31.3	21.7	32.8	21.6	29.5	22.5	31.7	21.8	31.4	22	30.7	22.5	32.7	22.6	29.5	23.4
7	31.2	21.4	32.1	21.6	30.2	23	32.4	21.6	32.8	21.4	30.6	21.1	31.6	22.3	30	23.5
8	32.8	20.6	31.2	21.6	30.2	22.6	31.2	21.5	32.3	22.2	30.7	21.9	32	22.7	29.3	23.4
9	31.4	22.1	30.2	22.6	29.5	23.5	31.2	22.5	30.4	23.1	30.5	22.4	31.8	22.5	29.7	23.2
10	31.1	22.6	30.1	22.7	30.2	24	30.7	23	30.1	23.1	30.8	23	32	23.4	29.7	23.9
11	31.5	23.1	31	23.1	28.6	23.1	30.2	22.4	30.6	23.1	30.6	22.6	32.2	23.3	29.6	23.7
12	29.2	23.4	29.2	23.3	28.1	23	30.2	22.9	28.3	22.1	29.3	23.3	26.5	23	28.3	23.6
13	32.8	25.1	32	22.1	30.2	23.4	30.3	21.2	32.2	21.7	33.6	21.6	31.3	22.6	30.3	22.9
14	31.4	24.9	32.1	23.5	31	24	31.2	24.5	33.5	22.5	33.8	22.8	31.5	22.5	31.1	24.6
15	32.6	25.2	31.8	22.1	28	21.9	31.7	21.6	28.7	21.2	31.2	22.9	31	24.3	30.3	24.2
16	29.8	22.9	28.6	22.8	27.1	22.7	31.2	22.1	31.1	21.8	30.4	22	30.3	23	30.5	23.6
17	30	21.7	29.6	21.3	28.5	22.4	30.7	21	31.7	21.5	31.5	21.2	31.4	22	29.6	24.1
18	31.4	21.6	31.1	21.6	30.6	22.5	31.8	21.8	32.3	21.6	31.5	21.8	32.5	22.4	30	23.5
19	32.7	21.6	30.6	21.6	30.4	22.4	31.7	23.2	32.7	22.5	30	22.4	29.8	22.9	29.5	23.6
20	32.4	22.3	32.4	22.6	30	24.6	31.8	22.4	32.1	22.6	29.9	22.2	30	22.5	30.1	23.6
21	32.1	22.3	31.4	21.3	29.5	23.4	31.7	22.2	30.4	22.6	29.9	23.5	31.4	23	27.8	23.9
22	31.8	21.4	30.1	23.6	29.4	23	31	22.3	30.2	22.6	29.4	22.5	31.5	22.7	28.2	23.8
23	32.2	22.6	30.6	22.6	30.4	23.4	31.2	21.8	31.8	22.1	30.7	22.3	32.9	22.6	29.5	24
24	28.8	21.9	30.8	21.9	29.2	22.5	30.6	23.2	32.2	22.6	29.7	22	30.5	23.4	27.1	23.3
25	31	21.7	32.6	22.6	31	22.5	30.2	22.3	33.8	22.2	29.4	22.4	31	22.2	28	23.7
26	28	22	30.8	22.6	30.2	22.8	31.7	22.9	34.3	22.1	30	22.9	29.5	22.8	29	23.1
27	30.5	21.1	31.9	22.1	29.7	22.9	31.5	21.9	34.3	22.3	30.3	22.8	30.9	21.9	29.8	23.4
28	31.3	21.4	31.6	22.6	30.4	22.7	32.5	21.5	35.4	22.1	29.9	22.2	31.4	22.4	30.1	23.3
29	31.8	20.5	32.6	22.1	29.9	22.4	32.2	20.8	33.7	21.6	30.2	22	32	22.9	29.5	23.1
30	32.3	21.9	34.4	22.6	31.9	22.8	32.7	22.2	34.6	22.9	30.7	22.3	30.7	23.6	29.5	22.9
31	28.3	21.9	29.4	22.2	30.1	22.9	30.2	22.2	32.3	22.5	30.7	22.7	29.4	23	28.1	23
Mean	31.1	22.2	31.2	22.3	29.8	23	31.4	22.2	32	22.3	30.7	22.3	31.4	22.8	29.5	23.6

Day.	Dumaguete.		Yap, W. Carolines.		Maasin.		San Jose Buenavista.		Cuyo.		Borongan.		Masbate.		Romblon.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	32	23	31.3	23.8	29.4	23	22.6	30.7	24.1	31.8	22.5	32.2	25.6	32.7	23.8	
2	32.7	22.7	31.7	23.1?	31.5	24.2	22.1	31.6	23.9	32	22.5	34.4	25.5	32.7	22.8	
3	33.1	23.1	29.6	24.2	31.5	24	23	31	23.9	31.6	21.1	33.6	23.4	33.4	23.3	
4	30.6	22.7	28.1	23.6	31.2	23.4	23.2	32	24	32.5	20.9	31.8	23.1	33.1	23.4	
5	31	22.3	30.8	22	31.1	23.5	23	29.6	23.5	31.6	20.5	32	25.2	30.1	22.3	
6	31.3	22.6	31.2	22.3	31.3	22.4	22.1	30.2	22.6	31.5	23	31.8	29.5	29.5	23	
7	32.1	22.6	30.8	22	29.6	23.5	22.6	29.1	23.1	31.6	19.8	32.8	25.2	33.2	22.7	
8	31.3	22	30.8	23.6	30	23.5	22.1	29.1	22.9	32.3	20.5	34	25.2	31.3	23	
9	31	22.7	30.7	22.3	31.2	23.8	21.6	31	23.7	32.1	22.8	32.5	25.8	32.1	23.1	
10	31.5	23.4	27.7	23.9	31.2	24.4	23.7	31	24.6	30.1	22.4	31.6	26.4	32.7	23.9	
11	29.2	23.8	27.2	22.3	31.2	24	23.5	30.5	26	33.1	22.4	30.8	24	28.2	23.4	
12	27.8	22.7	31	23.5	31	23.3	24.2	28.7	26	32.1	22.5	29.2	25.4	31.6	23.2	
13	30.3	23.5	31.5	26.1	29.5	25	24	29	24.6	32	23.5	28.2	25	30.8	23.8	
14	30	24	31.9	26	29.2	25	24.1	29	25.4	32.6	24.4	29.5	25.5	30.6	21.7	
15	32.2	23.8	33.2	25.9	29.6	25	23.1	27.7	24.2	32.8	23.5	31.2	23.6	30.6	21.7	
16	29.1	23	33	25.9	29.5	25	23.9	31.5	24.9	33.5	22.2	31.4	26.5	33.3	24.7	
17	30.8	22.6	33.9	24.5	29	23.5	23.6	31	24.6	33	22.2	29.8	26.2	33.4	24.2	
18	31	22.4	33.3	24.8	31.6	23.2	22.4	29.1	23.9	32	22.2	30.5	25.2	31.1	22.3	
19	30	22.9	32.7	24.6	31.4	23.1	23.5	28.3	23.7	32.9	21.1	31.2	25.4	31.7	22.4	
20	30.3	23.6	30.7	23	31.5	23.2	22.9	29.5	23.3	30.6	22.5	30.5	25.4	32.5	23	
21	30.5	23	28.3	23.1	31.5	23	22.7	29.7	23.4	30.1	22.5	29.6	24.5	31.8	22.8	
22	30.7	22.8	30.2	23.1	31.5	23	23.3	31	24	33.8	22.2	30.5	25.4	32	21.8	
23	31.7	21.7	30.6	22.7	29.5	23.1	23	29.4	24.4	33.6	22.2	30.2	25.4	32.1	22.4	
24	30.2	22.5	31.8	25	29.4	23	23	29.6	24.9	30.4	22.5	30.5	26.4	31.7	23.8	
25	30.5	23	30.3	23.2	29.3	23.7	21.6	29.6	25.4	31	20	29.6	25.5	31.6	21.4	
26	30.5	23.6	31.4	23.5	30	23.6	21.5	29.4	25.4	31.4	19.9	30	25.4	32.2	20.4	
27	30.8	22.6	32.1	23.9	30	23	20	30	25.1	31.2	19	30.6	23.4	32.2	21	
28	30.3	23.6	32.4	25	30.3	23.6	21	30.1	24.7	31	20.9	30.2	24	32.5	23.2	
29	30.4	23.1	31	24.5	29.4	23.2	22.5	30	25.9	30.9	21.7	30.2	24.8	31.2	23.8	
30	30.1	24.6	32.5	24.1	31	23.2	22.4	29.9	25.9	31.2	23.2	30.4	25.6	32.5	24	
31	29.8	23.2	32.4	24.9	31.4	23.1	23	30.2	26.3	28.3	21.9	30.2	24.8	29.3	24.2	
Mean	30.7	23	31.1	23.9	30.5	23.8	22.7	30	24.5	31.8	21.8	31	25.2	31.7	22.9	

Maximum and minimum temperatures for third-class and rain stations, October, 1913—Continued.

Day.	Batag.		Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1	30.9	23.1	34	22.9	27.6	23	32.6	22.4	30.4	21.2	33	20	32.9	23.4	32.2	20.6
2	30.7	23.5	33.7	23.5	29.6	22.6	33	22.6	28.6	21.7	33.3	21.9	32.4	23.9	32.5	20.2
3	31.5	23	33	23.1	30.3	25.3	32.5	22.6	30.1	21.6	33.6	21.6	31.1	23.2	32	20.4
4	31.2	22.5	31.9	23.8	29.7	23.5	30.6	22.9	28.7	22.8	33.4	21.9	32.7	23.3	32.3	20.6
5	31	22	32.2	22.6	29.3	23.5	29.1	22.4	29.6	21.5	32	21.8	31.9	22	32.6	20.3
6	31.5	22.2	32.3	23	28.7	23.5	30.6	23.2	30.6	21.3	32.7	21.4	31	22.6	32.9	20.1
7	31	22	31.6	22.6	29.7	23.4	32.2	22.5	28.4	21.3	31.2	20.9	31.5	21.7	30.1	19.7
8	31.5	22.4	32.3	22.4	29.6	23.7	32.5	22	30.8	21.6	32.2	21.1	31.9	21.9	31	19.9
9	28	23.7	30.5	23.2	30.2	24.9	31.8	21.2	28	22.5	31.6	22	31.9	21.7	31.3	19.4
10	29.6	22.6	32.5	23.6	28.5	23.4	32.5	23	27.6	22.3	29	22.2	32	23.8	32.2	20.2
11	28.5	22.5	28.8	24.2	26.4	23.1	29	27.2	23.1	25.6	22	22	28	23.8	30.9	19
12	29.5	22.9	26.9	23.3	27.8	23.4	29.6	23.6	26.5	22.2	25.9	21.5	28.8	23	28.3	18.4
13	29.3	22	30.5	23.6	29.1	23.4	27.6	22.8	28.5	23	28.2	22	29.9	23.7	28.6	18.2
14	30.3	22	31.7	24.6	30.5	22.9	26.1	22.5	29.8	22.8	28.7	22	27.9	24	28	17.6
15	29.5	23.4	30	25.7	27	24.8	30.6	22.5	30.7	23.4?	29.6	22	30.9	24.3	27.1	18.9
16	30.5	23.4	31.5	23.5	28.6	24.5	30.6	22.9	31	22.9	32.5	23	30.4	23.8	28.8	19.2
17	29.4	22	31.7	24	29.9	23.3	30	20.9	31.5	22.3	32	21.5	31.3	22.7	29.9	20
18	29	22	31.3	23.5	29.3	24.9	29.6	22	30	22.9	31.1	22.2	31	22	30.8	19.8
19	29.4	22.5	27	23.6	27.6	23.9	30	22	27	22.6	30.7	22.4	30.4	22.1	31.4	19.2
20	29	22	31.2	23.4	29.7	24.1	30	22.5	31.2	21.2	31.3	20.5	31.6	22	31.6	19.5
21	30	23.5	31.5	22.9	28.8	24.3	31.5	22	31.5	21	31	21	31.3	21.6	30	20.1
22	29.4	22.9	31.7	22.8	29.4	24.2	31	21.5	30.4	21.4	31.1	20.2	31.3	22	30.8	20.5
23	30.3	22.9	31.1	23.8	29.4	23.5	30.1	22.1	30.5	22.1	29.8	22	31.8	23	31.6	19.2
24	30	22.9	31.2	23.8	30.8	24.3	30.1	23.7	30.8	23	30.5	21.9	31.3	20.3	32	19.1
25	30.4	23.1	31.2	21.2	29.3	25.8	30	22.2	29.5	20.6	20.6	19.9	31.9	21.4	32.1	19.5
26	30.6	22.8	32.4	19.2	29.4	24.5	30?	20	27.6	19.4	30.8	16.6	31.5	18.8	31.5	19
27	30.4	20.7	32.3	19.8	30.8	25	30?	21.1	29.1	19.6	30.6	17	32.3	19	30	19.2
28	30.9	22.6	31.2	23	31.4	26.2	26.5	30	30	21.8	28.2	19.8	31.3	22.3	29.2	19.4
29	29.6	21.4	30	22.9	30.2	23.9	30	21.6	30.4	22.3	31.1	21.4	32.3	21.4	30	20
30	30.2	22.1	31.1	22.7	31	25.5	31.2	22.1	31.2	22	30.4	22.1	31.8	22.1	29.7	19.7
31	27	21.7	30.2	24.3	30.9	25.6	29.8	24.1	29	23.4?	29.4	21.3	32.3	22.5	30.5	19.1
Mean	30	22.5	31.3	23.1	29.4	24.2	30.3	22.3	29.6	22	30.7	21.1	31.2	22.4	30.7	19.5

Day.	Sta. Cruz, Laguna.		Antipolo.		Iba.		Tarlac.		Baler.		San Fernando, Union.		Echague.		Candon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1	33.4	23	32.4	22.3	32.5	21.8	33.3	23.5	32.7	22.6	33.5	23.7	33.9	23.2	31.3	25.1
2	33.9	23.1	33	22.7	32	23	34.6	23.6	34	24.1	33.6	24.7	33.8?	24	30.9	25
3	31.3	23	28.8	21.9	32	21.9	32.5	24.2	32.6	23.8	34.3	25	31.4	23.6	31.5	25.5
4	33	22.9	30.7	22.1	33	23.9	32.7	23.7	32.2	23.6	33	23.4	32	23	30.9	25.2
5	32	22.9	30.6	21.2	31.5	23	33.2	23.2	32.4	23.4	32.6	24.3	30.9	22.9	31.1	25
6	30.8	23.1	30.6	21.9	32	21.7	33	22.4	31.8	22.4	32.4	22.2	33.1	21.8	30.3	23.9
7	32.8	22.4	30.2	21.3	32.4	22.5	33.2	23	31.8	22.1	32.7	23	32.4	23.4	31.4	24.5
8	32.2	22	30.8	21	32.5	22	33.3	22.8	32.5	22	32.7	23	32.9	21.9	31.5	24.5
9	32.5	21.5	31	21.2	32.4	21.5	34	22.1	32.5	21.7	32.8	22.5	30.3	23.2	31.3	24.4
10	30.7	22.5	30.6	21.5	32	22.5	33.3	22.7	32	22.5	32.9	23.6	28.6	23.5	31.2	25
11	25.4	23.9	25.2	22.8	30.5	23	28	23	28.1	23.1	32.6	23.7	26.4	23.4	30.9	24.9
12	27.2	22.6	27.5	21.3	30.5	22.8	30.4	22.6	32.1	22.3	31.7	24.5	26.8	22.6	30.5	25
13	30.5	23	26.2	21.6	32	23	30.4	22.7	32.5	23.4	32.2	24.7	25.5	22.5	30.4	25
14	26.1	23.7	26	22.7	28.1	23.5	29.4	23.9	33	23.7	33.1	24.4	29.3	23.2	30	24.9
15	32.1	23.5	30	22.4	31.1	23.1	30.6	23.8	32.4	23	31.9	24.9	31.7	22.4	29.8	23.9
16	30.1	23.3	31	22.7	31.5	21.6	33	21.5	33.4	22.1	31.5	22	32.7?	22.4	28.9	24.4
17	31.2	23	30.1	20.2	31	19.4	31.7	20.8	31.6	22.3	31.2	20	29.3	20.9	28.9	21.5
18	31.6	22.2	30.9	21.3	31	21.5	32	22	31.3	22.4	32.7	22	30.1?	21.4	30.3	21.5
19	30.6	23.5	30.8	20.4	31	23	31	22.2	27.7	22	32.4	22.9	28.7	22	29.9	24.4
20	30.1	22.5	31.2	20.8	31.9	22	32	21.8	30.1	22.2	31.9	23.2	22.5	30.3	24.6	
21	30.8	22.2	30.8	20.7	31.5?	21.9	32.7	22.8	31.4	22	32.7	22.3	31.4	23.1	30.5	23.5
22	32.8	22	30.8	21	31.6	21.5	33	22.7	31.1	21.8	32.8	23	29.9	21.7	30.8	23.7
23	32	23.1	30	21.6	32.7	22.1	33.2	22.5	32.3	21.8	32.4	23	27.1	21.9	31.2	23.6
24	30.9	24	30.6	20.7	31.7	22.6	32	21.7	33	19.5	31.5	23.5	28	19.4	30	22.4
25	30.7	23	30	19.5	32	20.5	31.2	21.6	33.6	20	32.1	21.8	28.7	18.8	29.9	20.7
26	32.9	20	30.5	17.7	32.4	21.5	32.2	18.9	32.4	18.3	31.5	20.1	28.7	18.4	29.9	20.7
27	32.2	20	30.3	19.3	31.1	18	32.2	18.5	31.2	18.8	31.3	19.9	28.3	20.4	29.5	20.7
28	30.8	22.1	30.6	19.8	32	19.1	31.9	20.1	32.5	21	31.9	21	28.9	20.4	30.1	22.5
29	31.9	23.5	30.5	20.6	32	20	32.5	20.2	33	21.6	31.6	21	29.9	20.8	30.2	22.5
30	32.7	22.8	31.4	20.4	32	20	33	21	33.8	20.7	33.6	21.5	30.3	20.9	29.6	22
31	29.7	22.5	30.5	21.3	33.3	21	33	20.8	32.5	23.4	32.7	21.3	30.8	22	30.7	22.5
Mean	31.1	22.8	30.1	21.2	31.7	21.8	32.2	22.1	32	22.1	32.4	22.8	30	22	30.4	23.7

Maximum and minimum temperatures for third-class and rain stations, October, 1913—Continued.

Day.	Laoag.		Santo Domingo, Batanes.		Day.	Laoag.		Santo Domingo, Batanes.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.		°C.	°C.	°C.	°C.
1.....	33.1	23.7	30.4	23.6	18.....	31.3	20.7	27.9	20.9
2.....	33.2	23.5	30.5	23.9	19.....	31	21.5	29.4	20
3.....	33	23.3	30	22.6	20.....	30.7	23.1	30.4	
4.....	33.8	22.6	28.9	22.67	21.....	32.4	22	27.6	
5.....	34.2	23.5	28.8	22.8	22.....	32.2	22.1	27.9	22.2
6.....	32.5	22	30	22.6	23.....	32.5	23.7	26.9	22
7.....	32.7	22.7	29.5	23.3	24.....		18.4	27.3	
8.....	32.6	22.1	30.9	22.4	25.....			28	
9.....	34	23.4	29.4	23.6	26.....			26.3	22
10.....	34.5	23.5	29.9	23.6	27.....			26.6	21.8
11.....	34	23.9	29.4	23.7	28.....	32.2	18.8	26.7	21.2
12.....	31.5	24	28	22.4	29.....	32.5	18.4	26.4	21
13.....	28.5	23.9	28.6	22.6	30.....	31	21.1	26	
14.....	30.5	22.8	28.2	23.1	31.....	32.5	20	27.7	20.9
15.....	29.7	23	28						
16.....	29.6	23	27.9		Mean .....	32.1	22.1	28.4	22.4
17.....	30.7	18.8	28						



## SEISMOLOGICAL BULLETIN FOR OCTOBER, 1913.

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### EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

2, 9<sup>h</sup> 16<sup>m</sup> 48<sup>s</sup> \* [2, 17<sup>h</sup> 16<sup>m</sup> 48<sup>s</sup>]. **Aparri** (NE Luzon). Oscillatory earthquake, direction N-S, intensity III, duration 4 seconds.

2, 18<sup>h</sup> 32<sup>m</sup> [3, 2<sup>h</sup> 32<sup>m</sup>]. **Butuan** (N Mindanao). Oscillatory earthquake with slow movements, direction SE-NW, intensity III, duration 15 seconds.

7, 2<sup>h</sup> 12<sup>m</sup> 39<sup>s</sup> \* [7, 10<sup>h</sup> 12<sup>m</sup> 39<sup>s</sup>]. **Western Visayas and NW Mindanao**. An earthquake of large extension, which was felt in the NW of Mindanao and in the Islands of Cebu, Negros, Panay, and Cuyo. Its origin appears to have been to the SSW of Negros and the meizoseismic area comprehended a long narrow zone in the SW-NE direction not far from the island. This is deduced from the following data concerning the intensity. In Dumaguete, the station closest to the seat of origin, and situated close to the extreme SE of Negros the intensity was V-VI, direction SE-NW and the duration more than 20 seconds. In Dapitan, a station in the NW of Mindanao and to the SSE of the origin, the intensity was III and the duration 3 seconds. In the southern part of the islands of Panay and Cebu there was intensity III-IV with a relatively long duration. In Cuyo and the N of Panay and Negros the intensity was III. The earthquake was registered by the seismographs within the Philippines, but not by any outside the Islands.

10, 12<sup>h</sup> 54<sup>m</sup> 24<sup>s</sup> \* [10, 20<sup>h</sup> 54<sup>m</sup> 24<sup>s</sup>]. **Tuguegarao** (NE Luzon). Earthquake of intensity I-II. The origin of this earthquake was in the central cordillera of Luzon, in the Mountain Province. The intensity must have been very slight in all parts, since it was not noticed by anyone. The seismographs of the Observatory in Baguio, which is a little more than 100 kilometers from Tuguegarao, registered this earthquake with great amplitude on both the horizontal and vertical records, though few people felt it. According to the records on the instruments in Manila the epicenter was about 310 kilometers away, which would correspond to the SE part of the subprovince of Abra. At 13<sup>h</sup> 00<sup>m</sup> 11<sup>s</sup> [21<sup>h</sup> 00<sup>m</sup> 11<sup>s</sup>] there was a repetition of the same character. The seismographs of Manila and Baguio also registered another shock of smaller intensity at 14<sup>h</sup> 47<sup>m</sup> 26<sup>s</sup> [22<sup>h</sup> 47<sup>m</sup> 26<sup>s</sup>].

11, 14<sup>h</sup> 10<sup>m</sup> [11, 22<sup>h</sup> 10<sup>m</sup>]. **Butuan** (N Mindanao). Earthquake of intensity III, duration 10 seconds.

16, 16<sup>h</sup> 35<sup>m</sup> [17, 0<sup>h</sup> 35<sup>m</sup>]. **NE of Mindanao**. Earthquake of intensity V felt throughout the whole of the Province of Surigao and the northern part of the Agusan Valley. Its origin was probably in the peninsula of Surigao, perhaps in the region of Lake Mainit: it had the same intensity in Surigao and Butuan. At 19<sup>h</sup> 45<sup>m</sup> there was a light repetition, which was only felt in Surigao.

<sup>1</sup>The intensity of the earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance was registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observer who sent the report. All time indications are in Greenwich mean time (Midnight=0h), insular time being added in brackets for the convenience of Philippine readers.

23, 10<sup>h</sup> 52<sup>m</sup> 20<sup>s</sup> \* [23, 18<sup>h</sup> 52<sup>m</sup> 20<sup>s</sup>]. Island of Panay. Earthquake of intensity IV, felt throughout the Island. Its origin appears to have been within the island itself towards the NW of the Province of Iloilo, where the intensity was IV-V.

31, 23<sup>h</sup> 01<sup>m</sup> 00<sup>s</sup> \* [Nov. 1, 7<sup>h</sup> 01<sup>m</sup> 00<sup>s</sup>]. N of Luzon. Earthquake of intensity IV-V, felt throughout the whole of the extreme north of the Island. It probably originated close to the NE part of the island, as is deduced from the fact of the greater intensity and duration which it had in Aparri compared with Laoag.

Benguet (W of Luzon). Besides the earthquakes of the 10th, which were perceptible in the northern part of this region, the seismographs of Baguio registered on the 2d, 12th, 18th, 23d, and 24th of the month small movements of No. 1 of the scale, which were evidently local. This would seem to indicate that the forces which gave rise to the seismic period of August and September, had not quite returned to their state of equilibrium.

#### RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0<sup>h</sup>. Instrument: Wiechert seismograph; 1,000 kilograms.  $A_N$ :  $T_0=6.4$ ,  $\epsilon=2.21$ ,  $\frac{r}{T_0^2}=0.081$ ;  $A_E$ :  $T_0=6.5$ ,  $\epsilon=3.79$ ,  $\frac{r}{T_0^2}=0.024$ . Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
329	2	I	e F	<i>h. m. s.</i> 4 43 33 5 02				
330	2	Iv	eP L M <sub>N</sub> F	9 16 48 17 31 18 35 30	5-6	74		Aparri (NE of Luzon).
331	7	Iv	eP L M <sub>N</sub> F	2 12 39 13 48 15 04 28	4	74		Near south-southwestern coast of Negros Island.
332	7	Id	eP L F	19 23 31 24 03 27				
333	9	Id	eP L M <sub>N</sub> F	7 28 03 28 32 28 43 32	3	88		
334	9	I	e F	22 44 23 11				
335	10	Iv	eP L M <sub>N</sub> F	12 54 24 54 51 55 07 58	1	77		Central Cordillera of Luzon.
336	10	Iv	eP M <sub>N</sub> F	13 00 11 00 45 04	1-2	118		Central Cordillera of Luzon.
337	10	Iv	eP L M <sub>E</sub> F	14 47 26 47 39 47 45 50	1-2		77	Central Cordillera of Luzon.
338	11	Ir	e F	1 42 2 23				
339	11	Ir	e F	4 13 51 5 20				
340	11	Ir	e S L M <sub>E</sub> M <sub>N</sub> F	9 16 45 23 26 28 32 33 59 34 28 10 14	10 14		18 50	
341	12	Id	eP L M <sub>N</sub> F	15 52 17 52 42 53 22 57	3	44		



*Records of the microseismograph—Continued.*

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
342	12	I <sub>r</sub>	e F	<i>h. m. s.</i> 17 16 39				
343	14	II <sub>r</sub>	e L M <sub>E</sub> M <sub>N</sub> F	8 18 31 26 18 26 46 28 08 53	4-5 5-6	623 756		
344	18	I <sub>v</sub>	eP F	21 59 33 22 02				Baguio (W of Luzon).
345	21	I	e F	8 23 33				
346	22	I <sub>d</sub>	eP F	5 57 28 6 01				
347	22	I <sub>r</sub>	e F	6 57 16 7 16				From the Horizontal Pendulums.
348	23	I <sub>v</sub>	eP F	10 52 20 56				Panay Island.
349	23	I <sub>d</sub>	eP F	13 49 45 52				
350	24	I <sub>v</sub>	eP F	12 29 13 33				Baguio (W of Luzon).
351	29	I <sub>r</sub>	e M <sub>N</sub> M <sub>E</sub> F	4 37 32 51 48 52 08 5 02	14 14	7 6		
352	31	I <sub>v</sub>	eP F	23 01 00 05				Near northeastern part of Luzon.

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

2, 9<sup>h</sup> 16<sup>m</sup> 48<sup>s</sup> \* [2, 17<sup>h</sup> 16<sup>m</sup> 48<sup>s</sup>]. Aparri (NE de Luzón). Temblor oscilatorio, dirección N-S, intensidad III, duración 4 segundos.

2, 18<sup>h</sup> 32<sup>m</sup> [3, 2<sup>h</sup> 32<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio de movimientos lentos, dirección SE-NW, intensidad III, duración 15 segundos.

7, 2<sup>h</sup> 12<sup>m</sup> 39<sup>s</sup> \* [7, 10<sup>h</sup> 12<sup>m</sup> 39<sup>s</sup>]. Visayas Occidentales y NW de Mindanao. Temblor de tierra de grande extensión sentido en la parte NW de Mindanao y en las Islas de Cebú, Negros, Panay y Cuyo. Su origen parece se hallaba al SSW de la Isla de Negros y su área meizoséismica debía comprender una zona estrecha y prolongada en la dirección SW-NE, no lejos de las costas de la mencionada isla, según se desprende de los siguientes datos sobre su intensidad. En Dumaguete, la estación más cercana al origen, situada cerca del extremo SE de Negros tuvo intensidad V-VI, dirección SE-NW, y duración muy larga de más de 20 segundos. Dapitan, estación del NW de Mindanao y al SSE del origen lo sintió con intensidad III, duración unos 3 segundos. En la parte sur de las Islas de Panay y Cebú tuvo intensidad III-IV y duración relativamente larga. En la Isla de Cuyo y N de Panay y Negros tuvo intensidad III. Registráronlo los seismógrafos del Archipiélago pero no los de los observatorios de fuera de Filipinas.

10, 12<sup>h</sup> 54<sup>m</sup> 24<sup>s</sup> \* [10, 20<sup>h</sup> 54<sup>m</sup> 24<sup>s</sup>]. Tuguegarao (NE de Luzón). Temblor de tierra de intensidad I-II. El origen de este temblor se hallaba en la cordillera central de Luzón, en la Provincia Montañosa; no debió tener mucha intensidad en ninguna parte puesto que ninguna otra estación dió cuenta de él. Los seismógrafos del observatorio de Baguio, situado a poco más de 100 kilómetros de distancia al S del paralelo de Tuguegarao, lo registraron con grande amplitud de las componentes horizontal y vertical pero sin ser perceptible más que a pocas personas que se hallaban acostadas y despiertas. Los registros de Manila colocan el epicentro a unos 310 kilómetros de distancia, que correspondería a la parte SE de la subprovincia de Abra. A las 13<sup>h</sup> 00<sup>m</sup> 11<sup>s</sup> [21<sup>h</sup> 00<sup>m</sup> 11<sup>s</sup>] hubo una repetición del mismo carácter: además los seismógrafos de Baguio y de Manila registraron a 14<sup>h</sup> 47<sup>m</sup> 26<sup>s</sup> [22<sup>h</sup> 47<sup>m</sup> 26<sup>s</sup>] otra de menor intensidad.

11, 14<sup>h</sup> 10<sup>m</sup> [11, 22<sup>h</sup> 10<sup>m</sup>]. Butuan (N de Mindanao). Temblor de tierra de intensidad III, duración 10 segundos.

16, 16<sup>h</sup> 35<sup>m</sup> [17, 0<sup>h</sup> 35<sup>m</sup>]. NE de Mindanao. Temblor de tierra de intensidad V, sentido en toda la Provincia de Surigao y en la parte N del Valle del Agusan. Su origen se hallaba probablemente en la misma península de Surigao, tal vez en la región del lago Mainit: tuvo casi la misma intensidad en las estaciones de Surigao y Butuan. A 19<sup>h</sup> 45<sup>m</sup> hubo una ligera repetición de que solamente dió cuenta la estación de Surigao.

23, 10<sup>h</sup> 52<sup>m</sup> 20<sup>s</sup> \* [23, 18<sup>h</sup> 52<sup>m</sup> 20<sup>s</sup>]. Isla de Panay. Temblor de tierra de intensidad IV, sentido en toda la Isla de Panay. Su origen parece se hallaba dentro de la isla hacia la parte NW de la Provincia de Iloilo donde tuvo intensidad IV-V.

31, 23<sup>h</sup> 01<sup>m</sup> 00<sup>s</sup> \* [1.º Nov., 7<sup>h</sup> 01<sup>m</sup> 00<sup>s</sup>]. N de Luzón. Temblor de tierra de intensidad IV-V sentido en todo el extremo N de la Isla de Luzón. Su origen se hallaba probablemente cerca de la parte NE de la isla, según se desprende de la mayor intensidad y duración que tuvo en Aparri comparadas con las de Laoag.

Benguet (W de Luzón). Además de los temblores de tierra sentidos el día 10 los cuales fueron perceptibles en la parte N de esta región, los seismógrafos del observatorio de Baguio registraron pequeños movimientos del Grado I, evidentemente muy locales, los días 2, 12, 18, 23 y 24. Esto indica que las fuerzas que dieron lugar al período séismico de Agosto y Septiembre no han vuelto aún del todo a su estado de equilibrio.

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.

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## BULLETIN FOR NOVEMBER, 1913.



# METEOROLOGICAL BULLETIN FOR NOVEMBER, 1913.

By Rev. JOSÉ CORONAS, S. J.  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

Pressure and temperature.—Owing in great part to the absence of atmospheric disturbances in the neighborhood of the Philippines during this month, the monthly mean atmospheric pressure was about 2 mm. higher than that of November, 1912. In Manila it was 1.62 mm. higher than the normal of this month. The highest pressures were observed on the 20th and 24th; the lowest on the 27th.

The mean monthly temperature was very similar to that of November, 1912, the greatest departures being  $-0.5^{\circ}$  C. and  $-0.6^{\circ}$  C. in Ormoc, Calbayog, and Manila. The extremes in Manila were  $33.7^{\circ}$  C. on the 9th, and  $18.1^{\circ}$  C. on the 15th.

### PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR NOVEMBER, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from November, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from Nov., 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		$^{\circ}$ C.	$^{\circ}$ C.	$^{\circ}$ C.		$^{\circ}$ C.	
Tagbilaran	759.69	-----	761	24	757.94	27	25.6	-----	32.9	24	19.3	14
Surigao	59.66	+2.05	60.93	24	57.93	27	26	-----	31.7	19	21.2	14
Cebu	59.77	-----	61.08	24	58.02	27	27.1	-----	32.1	29	22.8	16
Iloilo	59.68	+2.07	61.18	24	57.77	27	26.5	+0.2	32	4	21.5	14
Ormoc	59.98	+2.22	61.24	20	58.32	27	25.8	-.5	33.1	22	19	14
Tacloban	60	+2.13	61.38	20	58.12	27	26.1	-----	32.6	12	21.6	14
Capiz	60.23	+2.36	61.85	24	57.94	27	26.6	+ .2	32	3, 6, 27	22.7	28
Calbayog	60.05	+2.19	61.55	24	57.78	27	25.3	-.5	33.2	12	19.2	14
Legaspi	60.34	+1.97	61.88	24	57.49	27	26.5	-.2	34.4	3	21.5	18
Atimonan	60.95	+2.02	62.88	24	57.37	27	26.3	-.1	29.5	3, 6	22	28
Ambulong, Tanauan	60.48	-----	62.16	24	57.82	27	25.9	-----	32	6	19	14
Paracale	61.16	+2.07	63.33	24	57.32	27	26.4	-.2	30.8	2, 6, 12	20.8	22
Manila	61.04	+2.10	62.79	24	58.47	27	25.1	-.6	33.7	9	18.1	15
San Isidro	61.22	+2.02	62.90	24	58.86	27	25.2	-.4	32.5	9	17.4	15
Dagupan	60.30	+1.82	61.77	20	58.09	27	26.8	0	36.1	8	19	15
Bolinao	60.57	+2.06	62.05	20	58.29	27	27.1	+ .3	33.5	20	19.8	15
Baguio*	638.24	+1.66	639.70	20	636.23	27	17.7	-.3	26.2	8	12	25
Vigan	760.62	+2.01	762.14	24	758.24	27	26.9	+ .1	34.7	10	19.9	18
Tuguegarao	62.51	+2.10	65.24	24	60.19	27	24.6	-.2	34.1	9	17.3	14
Aparri	62.62	+2.08	65.50	24	60.18	27	25	-.2	31	9	20	18

\* The barometric readings of this station are not reduced to sea level.

Rainfall.—The absence of atmospheric disturbances mentioned above must be considered as the principal cause of the deficit of rain which was noted in almost all the stations of the Archipelago during the month. Of the 50 stations in the Philippines included in the table of rainfall, only eight of them had more rain than in November, 1912, and of the 27 stations for which the normal rainfall is given in that table, only two had more rain than the normal.

In Manila there was only a rainfall of 31.1 mm., which is less than the normal by 97.8 mm. and less than the precipitation of November, 1912, by 133.4 mm.

RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF NOVEMBER, 1913.

Station.	Total.	Departure from Nov., 1912.	Departure from normal.	Rainy days.	Departure from Nov., 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from Nov., 1912.	Departure from normal.	Rainy days.	Departure from Nov., 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.			mm.			mm.	mm.	mm.			mm.	
Jolo	111.2	- 65.5	- 68.8	9	- 8	29.7	8	Virac	436.3	+ 41.9	-	24	+ 1	76.4	29
Isabela, Basilan	118.7	+ 70.1	-	9	+ 1	55.1	5	Nueva Caceres	339.5	+ 41.1	+ 77.4	18	- 1	115.6	23
Zamboanga	38.9	- 4.1	- 62.7	6	0	26.7	24	Batangas	48.3	- 91	-	14	- 2	15	8
Davao	207.1	- 67.6	+ 39.2	12	0	53.3	29	Atimonan	444.2	+ 53.4	- 19.1	23	0	107.2	27
Cotabato	70.5	- 136	- 161.2	11	- 1	26.2	7	Ambulong, Tanauan	24.7	-	-	11	-	4.8	19
Butuan	158.1	- 199.8	- 129.8	16	- 6	57.9	9	Silang	42.9	- 33.3	-	11	+ 1	6.8	8
Dumaguete	64.6	- 190.8	-	13	+ 3	16.3	4	Paracale	482	+ 76	-	28	0	84.4	21
Yap, W. Carolines	30.8	- 292.8	-	13	- 8	9.4	16	Sta. Cruz, Laguna	101	- 125.1	-	25	+ 8	22.4	4
Tagbilaran	130.8	- 62.5	- 62.5	12	-	42.4	8	Manila	31.1	- 133.4	- 97.8	12	- 3	6.7	20
Surigao	282.8	- 392.2	- 136.8	20	+ 1	93.6	8	Antipolo	21.5	- 185.7	-	9	-	6.3	27
Maasin	135.2	- 613.3?	- 180.6	6	- 5	69.6	8	Iba	2.4	- 63.1	-	1	- 11	2.4	20
Cebu	28.3	- 126.2	- 82	7	-	12	8	San Isidro	39.6	- 37.3	- 54	6	- 1	19.3	1
Iloilo	105.8	- 304.6	-	8	- 7	43.7	4	Tarlac	9.9	- 69.8	- 71.8	3	- 10	5.8	5
San Jose Buenavista	47.4	- 362.6	-	7	- 5	28.2	8	Baler	217.9	- 544.1	-	14	- 7	80.6	5
Cuyo	1.5	- 346	-	1	- 10	1.5	8	Dagupan	2.8	- 18.8	- 58.8	1	- 4	2.8	5
Ormoc	156.9	- 62.7	- 21	+ 2	-	25.2	6	Bolinao	4.8	- 22.6	- 37.8	4	0	3	5
Tacloban	247.6	-	-	25	+ 6	59.2	26	Baguio	60.7	- .8	- 29.4	6	- 5	30	5
Capiz	90.6	- 333.9	- 198	20	- 2	12.9	8	San Fernando, Union	.8	- .6	- 42.1	1	- 3	.8	5
Borongan	410	- 367.8	- 101.1	26	+ 3	60.4	16	Echague	91.6	- 179.2	-	14	- 7	22.6	19
Calbayog	207.3	- 147.1	- 60.8	27	+ 2	28.7	4	Candon	19.3	+ .3	-	3	- 1	12.7	28
Masbate	58.7	- 142.2	-	13	- 2	19.6	5	Vigan	1.6	+ 1.3	- 38.7	1	0	1.6	5
Romblon	99.3	- 198.3	-	19	- 2	20.8	4	Tuguegarao	40.7	- 211.1	- 223.5	8	- 8	17.2	27
Batag	449.3	-	-	27	-	72.4	26	Laoag	22.7	+ 20	-	2	- 1	22.4	2
Gubat	193.9	- 120.5	-	18	- 8	27.2	23	Aparri	94.9	- 269.9	- 189.1	18	- 3	16.8	27
Legaspi	319.1	- 13.3	- 29.6	24	+ 4	66	23	Sto. Domingo, Bata-							
Sumay, Guam	377.5	+ 221	-	19	0	179.1	10	nes	280	- 141.6	-	20	- 5	60.6	4
Calapan	154.1	- 54.5	-	25	+ 2	31.5	19								

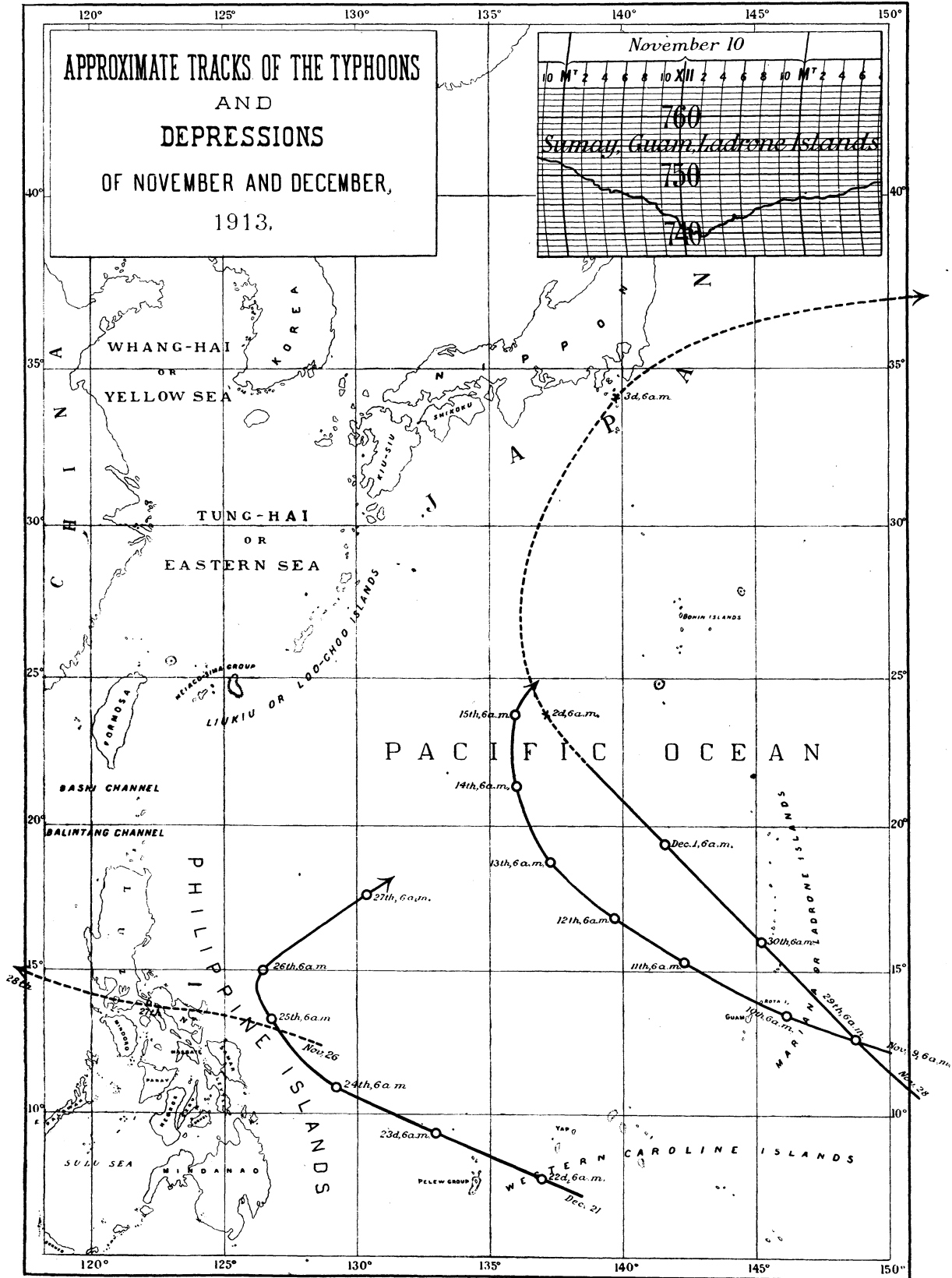
DEPRESSIONS AND TYPHOONS.

During the whole of this month there were only two typhoons throughout the entire region of the Far East, and both of them crossed the Ladrone or Mariana Islands, but without having any influence on the Philippines, in that they recurved soon northwards. In Plate XV are given the tracks of these two typhoons together with that of a depression of slight importance which crossed the southern part of Luzon on the 27th. To save space, there is included in the same plate the track of a typhoon which occurred during December, though the discussion of this typhoon is reserved for the December Bulletin.

The typhoon of the Mariana or Ladrone Islands, November 9-15, 1913.—This typhoon appeared to the ESE of Guam at daybreak of the 9th. It seemed certain that it had been formed some days earlier, but lack of data makes it impossible for us to determine exactly the date and region of its formation. On the 10th the following was announced by the Observatory in Manila:

November 10, 11.30 a. m.: A typhoon appeared yesterday noon to the ESE or E of Guam. Its center was situated at 6 o'clock this morning near the southern Ladrone Islands, to the ENE of Guam, moving apparently to W by N.

Below are given a series of observations made at Guam during the storm. From them it will be seen that the vortex passed a few miles to the north of the station a little after midday of the 10th, and was then moving to the WNW. Our observer in Yap writes that according to news received from the German cruiser *Cormoran*, Rota Island (14° 09' lat. N; 145° 03' long. E) was visited by a hurricane on the 10th and that all the houses on the island were completely destroyed.



## METEOROLOGICAL OBSERVATIONS AT SUMAY, GUAM, LADRONE ISLANDS, NOVEMBER 9 TO 13, 1913.

Date and hour.	Pres- sure.	Wind.		Rain in 24 hours. begin- ning 6 a. m.	Date and hour.	Pres- sure.	Wind.		Rain in 24 hours. begin- ning 6 a. m.
		Direc- tion.	Force.				Direc- tion.	Force.	
Nov. 9:	<i>mm.</i>	<i>0-12.</i>	<i>mm.</i>		Nov. 10:	<i>mm.</i>		<i>0-12.</i>	<i>mm.</i>
6 a. m. ....	756.26	NE	2		5 p. m. ....	742.19	SW	9	
Noon .....	54.56	N	4		6 p. m. ....	42.78	SW	9	
2 p. m. ....	53.40	N	2		8 p. m. ....	44.49			
4 p. m. ....	53.13	N	3		10 p. m. ....	45.76			
6 p. m. ....	53.96	N	3		12 midnight	46.50			179.1
8 p. m. ....	53.86	NNW	2		Nov. 11:				
10 p. m. ....	52.70				2 a. m. ....	46.22			
12 midnight	51.10			136.5	4 a. m. ....	47			
Nov. 10:					6 a. m. ....	48.34	SSW	9	
2 a. m. ....	49.20				8 a. m. ....	49.75	SSW	8	
4 a. m. ....	48				10 a. m. ....	50.35	SSW	8	
6 a. m. ....	46.94	NW	4		Noon .....	49.66	SSW	8	
8 a. m. ....	45.55	NW	4		2 p. m. ....	49.01	SSW	6	
9 a. m. ....	44.45	WNW	4		4 p. m. ....	49.40	SSW	6	
10 a. m. ....	43.48	W	5		6 p. m. ....	50.96	SSW	4	9.5
11 a. m. ....	41.95	WSW	5		Nov. 12:				
Noon .....	40.85	WSW	7		6 a. m. ....	53.27	SSW	3	
1 p. m. ....	40.43	WSW	7		2 p. m. ....	52.85	SSW	3	.6
2 p. m. ....	39.26	WSW	10		Nov. 13:				
3 p. m. ....	40.23	WSW	9		6 a. m. ....	54.71	SSW	2	
4 p. m. ....	41.41	WSW	9		2 p. m. ....	54.06	SSW	2	

The typhoon curved decidedly to the north from the 12th till the 15th when it filled up to the SW of the Bonin Islands. The following notes were published by the Observatory:

November 14, 3.30 p. m.: The typhoon was situated at 6 o'clock this morning, about halfway between the Ladrone and the Loochoos, and continues moving very slowly northwestward.

November 15, 11.30 a. m.: The typhoon over the Pacific seems to be recurving northeastward and may be filling up gradually. Its center was situated at 6 o'clock this morning to the southwest of the Bonins.

November 16, 11.30 a. m.: The typhoon filled up yesterday to the southwest of the Bonin Islands.

**Depression of November 27, 1913.**—This depression was of very little importance for the Philippines, so we simply copy the notes published by the Observatory at the time of the depression:

November 27, 11.45 a. m.: A shallow depression, of little importance at present has appeared this morning in the neighborhood of southeastern Luzon.

November 28, 11.50 a. m.: The low-pressure area, which yesterday covered the southern part of Luzon, has moved toward the China Sea. It appears in this morning's weather map to the W of Luzon.

**The typhoon from November 28 to December 3, 1913.**—This typhoon appeared on the 28th to the SE of Guam, near the Western Carolines, moving NW, and passed by the N of Guam at a fair distance from that island during the morning of the 30th. After December 2 it could only be distinguished as a depression which recurved to the NE and passed not far from the SE of Japan on the morning of the 3d.

The following notes were published by the Observatory:

November 29, 10.30 a. m.: There are signs of a typhoon forming over or near the northern part of the Western Carolines to the SE of Guam.

November 30, 11 a. m.: The depression or typhoon mentioned yesterday lies at present in the neighborhood of the Ladrone Islands moving apparently northward.

December 1, 11.20 a. m.: The typhoon of the Ladrone Islands continues moving NNW or N toward the Bonins.



## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—Debido en gran parte a la ausencia de perturbaciones atmosféricas en las cercanías de Filipinas, la presión atmosférica media de este mes resulta para todas las estaciones unos 2 mm. más alta que la del año pasado. La de Manila difiere de la normal de Noviembre en +1.62 mm. Las presiones mayores se observaron el 20 y 24, y las menores el 27.

La temperatura media mensual es muy parecida a la de Noviembre, 1912, siendo las mayores diferencias de  $-0.5^{\circ}$  y  $-0.6^{\circ}$  C. correspondientes a Ormoc, Calbáyog y Manila. Las temperaturas extremas para Manila fueron  $33.7^{\circ}$  y  $18.1^{\circ}$  C. registradas los días 9 y 15 respectivamente.

**Precipitación acuosa.**—La ausencia de perturbaciones atmosféricas indicada arriba debe considerarse también como causa principal del *deficit* de lluvia que se nota en casi todas las estaciones de nuestro Archipiélago durante este mes de Noviembre. De las 50 estaciones de Filipinas incluidas en la tabla de lluvia que acompaña el texto inglés, solamente 8 dan un total de precipitación acuosa mayor que en Noviembre del año pasado. Asimismo, de las 27 estaciones para las cuales podemos dar valores normales, solamente aparecen 2 con una cantidad de lluvia mayor que la normal. En los pluviómetros de Manila no se recogieron en todo el mes más que 31.1 mm. de agua: cantidad que se diferencia en  $-97.8$  mm. de la normal, y en  $-133.4$  mm. de la lluvia de Noviembre de 1912.

## DEPRESIONES Y TIFONES.

Solamente dos tifones han ocurrido este mes en todo el Extremo Oriente. Ambos atravesaron las Islas Ladroneas o Marianas, pero ninguno de ellos influyó en Filipinas por haber recurvado muy pronto hacia el norte. En la Lámina XV verán nuestros lectores las trayectorias de estos tifones juntamente con la de una depresión de poquísima importancia que cruzó la parte sur de Luzón el día 27. Por motivos de economía incluimos en la misma lámina la trayectoria de otro tifón de Diciembre, aunque diferimos su discusión para el boletín de dicho mes.

El tifón de las Islas Ladroneas o Marianas, 9 a 15 de Noviembre de 1913.—Apareció este tifón al ESE de Guam la madrugada del día 9. Parece cierto que estaba ya formado los días anteriores, pero por falta de datos nos es imposible precisar la fecha y región en que se formó. El Observatorio de Manila lo anunció en Manila la mañana del 10 en estos términos:

Noviembre 10, 11.30 a. m.: Un tifón apareció ayer a mediodía al ESE o E de Guam. Su centro se hallaba a las 6 de esta mañana en, o cerca de, la parte sur de las Islas Ladroneas o Marianas al ENE de Guam, moviéndose aparentemente al W½NW.

En el texto inglés ofrecemos a nuestros lectores una serie de observaciones hechas en Guam durante este baguio. Por ellas se ve que el vórtice pasó a unas pocas millas de distancia al norte de aquella estación poco después de mediodía del 10, moviéndose por entonces al WNW. Nuestro observador de Yap nos dice que, según noticias recibidas por el crucero alemán *Cormoran*, la Isla Rota ( $14^{\circ} 09'$  latitud N,  $145^{\circ} 03'$  longitud E) fué visitada el día 10 por un huracán que destruyó completamente todo el caserío de la población.

El tifón se inclinó decididamente al norte desde el día 12 hasta que se deshizo el 15 al SW de las Islas Bonín. Damos a continuación las notas dadas por el Observatorio de Manila los días 14, 15 y 16:

Noviembre 14, 3.30 p. m.: El tifón se hallaba a las 6 de esta mañana a la mitad de camino entre las Islas Ladroneas y Liukiu, y continúa moviéndose muy despacio al NW.

Noviembre 15, 11.30 a. m.: El tifón del Pacífico parece hallarse recurvando hacia el NE y puede ser que se esté rellenando gradualmente. Su centro se hallaba a las 6 de esta mañana al SW de las Islas Bonín.

Noviembre 16, 11.30 a. m.: El tifón se deshizo ayer al SW de las Islas Bonín.

**Depresión de 27 de Noviembre de 1913.**—Sobre esta depresión, que fué de muy poca importancia para Filipinas, nos contentaremos con reproducir aquí las notas referentes a ella que publicó el Observatorio de Manila los días 27 y 28:

Noviembre 27, 11.45 a. m.: Una depresión dilatada, de poca importancia al presente, ha aparecido esta mañana en los alrededores de la parte sudeste de Luzón.

Noviembre 28, 11.50 a. m.: El área de baja presión que cubría ayer la parte sur de Luzón se ha movido hacia el Mar de China: aparece en el mapa del tiempo de esta mañana al W de Luzón.

**Tifón de 28 de Noviembre a 3 de Diciembre de 1913.**—Este tifón apareció el 28 al SE de Guam en los alrededores de las Carolinas Occidentales, y moviéndose al NW pasó por el N y a regular distancia de Guam la mañana del día 30. Desde el día 2 de Diciembre apenas se le puede distinguir más que en forma de depresión que recurvó al NE y pasó cerca de la parte sudeste de Japón la mañana del 3.

El observatorio de Manila dió al público de Manila las siguientes notas referentes a este tifón:

Noviembre 29, 10.30 a. m.: Hay indicios de un tifón que se está formando en, o cerca de, la parte norte de las Carolinas Occidentales, al SE de Guam.

Noviembre 30, 11 a. m.: La depresión o tifón mencionado ayer se halla al presente en los alrededores de las Islas Ladrones o Marianas, moviéndose aparentemente hacia el norte.

Diciembre 1, 11.20 a. m.: El tifón de las Islas Ladrones o Marianas continúa moviéndose al NNW o N hacia las Islas Bonín.

METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.<sup>a</sup>[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>				Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50 meters.	2.50 meters.	Free expo- sure (total).			Shelter (total).	
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	8 a. m.	8 a. m.					
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.	
1.	760.47	25.3	30.5	23	28.7	28.9	29.2	29.3	29.3	28.8	88.3	21.1	1.6	1.3	
2.	60.35	26	31.8	22.2	28	28.7	29.1	29.2	29.2	28.8	82.4	20.4	2.7	2.2	
3.	60.58	25.4	32.1	22.2	28	28.7	28.9	29.1	29.2	28.8	88.1	21.1	1.6	1.6	
4.	60.61	24.7	28.2	22.8	28	28	28.8	28.8	29.2	28.9	93.1	21.5	.3	.7	
5.	60.91	24.9	28.2	22.8	27.7	27.8	28.8	28.7	29.2	28.9	89.5	21	.7	.9	
6.	60.61	25.6	30.9	22.3	27.3	27.8	28.4	28.5	29.1	28.8	89.4	21.8	1.4	1.3	
7.	60.75	26	31.8	22	27.4	28.1	28.4	28.5	29.2	28.8	83	20.5	2.6	2	
8.	61.10	25.4	30	22.7	27.6	27.8	28.5	28.7	29.2	28.9	85.9	20.8	.9	1.2	
9.	60.64	26.7	33.7	21.7	27.4	28.5	28.5	28.6	29.1	28.8	77.5	19.9	4.1	3.2	
10.	60.60	25.1	30.1	22.3	28	28.4	28.6	28.6	29.2	28.8	87.2	20.5	1.5	1.5	
11.	60.59	25.5	32.2	21.4	27.5	28.3	28.5	28.6	29	28.8	77.6	18.6	3.6	2.7	
12.	61.05	25.5	31.7	19.4	27.3	28.2	28.4	28.6	29	28.8	76.9	18.4	3.9	3	
13.	61.20	24.5	30.2	21.2	27.7	28.3	28.6	28.6	29	28.8	80.3	18.3	2.6	2.2	
14.	61.25	23.9	31.4	19.5	27.3	28.2	28.4	28.4	28.9	28.7	72.4	15.5	4.7	3.9	
15.	61.90	23.8	29.6	18.1	27.3	27.5	28.3	28.2	28.8	28.7	77.3	16.8	3.2	2.5	
16.	61.82	24.9	30.2	21.2	27.2	27.9	28.2	28.2	28.9	28.7	83.6	19.4	2.5	2	
17.	61.20	24.9	30.9	20.9	27.1	27.8	28.2	28.2	28.8	28.7	77.2	17.9	3.9	2.9	
18.	62.12	25.1	31.7	21.6	27.3	27.8	28.2	28.2	28.8	28.7	75.4	17.7	3.1	2.5	
19.	62.27	25.6	31.4	21.3	27.3	27.8	28.1	28.4	28.8	28.7	80.6	19.5	2.9	2.5	
20.	62.58	24.7	29	22.5	27.3	27.5	27.9	28	28.6	28.7	90.2	20.8	.7	.9	
21.	61.78	25.7	31.8	21.5	27	27.7	27.9	28	28.7	28.6	77.5	18.8	5	4	
22.	61.20	24.9	28.8	22.3	27	27.3	27.9	27.9	28.7	28.5	84.8	19.8	1.9	1.6	
23.	62.28	25.4	30.9	21.7	26.8	27.5	27.8	27.8	28.7	28.6	78.6	18.8	3.5	2.7	
24.	62.79	24.7	30.9	20.6	26.8	27.3	27.8	27.8	28.7	28.6	74.9	17.1	4	3.4	
25.	62.34	23.6	30.7	18.7	26.3	26.8	27.7	27.8	28.6	28.4	72.4	15.5	5.1	4.2	
26.	60.33	25.1	31.3	20	26.1	27.3	27.4	27.6	28.6	28.4	72.7	16.9	5.2	3.9	
27.	58.47	23.9	26.8	21.3	26.6	26.8	27.6	27.5	28.5	28.4	84.1	18.5	.8	1.2	
28.	59.33	25.4	31.9	21.6	26.4	27.3	27.6	27.6	28.5	28.6	83.2	19.9	2.9	2.2	
29.	59.79	25.7	31.6	21	26.3	27.8	27.6	27.6	28.5	28.6	82.5	20	3.2	2.2	
30.	60.28	25.4	31.2	22.3	27.3	27.9	27.8	27.9	28.6	28.6	83.3	20	2.2	1.9	
Mean Total	761.04	25.1	30.7	21.4	27.3	27.9	28.2	28.3	28.9	28.7	81.7	19.2	2.7	2.3	
Departure from normal	+1.62	-0.8	+0.4	-0.8							-0.7	-1.1			

Day.	Wind.				Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.	
	Prevailing direction.	Total move- ment.	Maxi- mum hour- ly veloc- ity.	Direction at the time of the maximum velocity.		Form and its direction.					
						Upper.	Lower.				
		Km.	Km.		0-10.			h. m.	mm.		
1.	N quad.	86	9.5	NNE	10	Cl.-S.	S.-Cu.	ESE	0 00	2	●° a.
2.	NW quad.	95	13.5	WNW	7.6	A.-Cu.	Cu.	ESE	4 35		p° p.
3.	W quad.	81	12.5	WNW	5.7	Cl.	Cu.	E	4 55	4.6	1/4 ● p.
4.	NNE	72.5	7	NNE	9.8	Cl.-S.	Cu.-N.	ESE	0 25	2.6	● a. d p.
5.	N	78.5	8.5	N	9.8	Cl.-S.	Cu.-N.	E	0 25	1.5	≡ a. ● p.
6.	NW	86.5	12	NW	8	Cl.	Cu.	E	3 20	2.6	● p.
7.	N, E	94.5	10	NNE	7.8	Cl.	Cu.	E	4 00		
8.	N quad.	81	10	NNW	8.7	Cl.-S., A.-Cu.	Cu.	E	1 00	2.6	● a. p.
9.	NE	167.5	20	NE	6.5	Cl.-S.	Cu.	ENE, E	9 20		
10.	N quad.	99	13.5	NNE	6.7	Cl.-S.	Cu.	E	4 05		
11.	NE, WSW	147.5	15	E	5.9	A.-Cu.	Cu.	E	8 25	3.4	●° a. p.
12.	Variable	140.5	14	WNW	3	Cl.	Cu.	E	9 15		
13.	E	107.5	11.5	NNE	7.8	Cl.	Cu.	E	2 35		
14.	NE	185.5	24	NE	5.9	Cl.	Cu.	ENE	7 10		
15.	NW quad.	102.5	16.5	NW	6.6	Cl.-S.	Cu.	NE	5 00	.5	d p.
16.	W quad.	82	10	WNW	5.3	Cl.	Cu.	NE	8 10	1.3	d p° a.
17.	WNW, ESE	107	14.5	WNW	3.8	Cl.	Cu.	NE	9 05		
18.	W, ESE	79	12	W	5.9	A.-Cu.	Cu.	NE	4 50		
19.	NE	132	21	NE	7.3	A.-Cu.	Cu.	E	4 05		p° a.
20.	N quad.	79.5	12.5	NW	9.2	Cl.-S.	Cu.-N.	E	0 00	6.7	~2 ● a. T° p.
21.	NE	210	27	NNE	5.2	Cl.	Cu.	E	6 50		
22.	NNE	142.5	15.5	NNE	8.2	Cl.-S.	Cu.	E	0 05	.3	d p.
23.	Variable	92	10	WSW	8.5	Cl.-S.	Cu.	E	3 25		
24.	NE	192.5	29	NE	7.1	A.-Cu.	Cu.	E	4 05		
25.	NE, NNE	246.5	23	N	4.8	A.-Cu.	Cu.	E	6 10		≡° a.
26.	NE	147	16	WNW	6.8	A.-Cu.	Cu.	E	6 40		d° a.
27.	NNE	233	22	NbyE	9.8	Cl.-S.	Cu.-N.	E	0 00	3	● a. d° p.
28.	NE, WNW	112.5	13	NW	4.7	A.-Cu.	Cu.	E	7 45		
29.	W, WNW	101	14.5	WNW	3.1	Cl., A.-Cu.	Cu.	E	8 25		
30.	SE	86	9	WSW	5.4	A.-Cu.	Cu.	ENE	5 30		
Mean Total		122.2 3,667.5	14.9		6.8				4 39 139 35	31.1	
Departure from normal		-1,156			+0.4				-21 54	-97.8	

<sup>a</sup> All the mean values given in this table are deduced from hourly observations.<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.

## METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.\*

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.						mm.		
1.	759.33	25.4	30.4	22.6	94.2	22.7	NW, SW	0-12.	0-10.	Ci.	Fr.-N.	E		
2.	59.32	26	31.2	22.8	93.3	23.3	SSE	0.5	4.8	Ci.-S.	Cu.	NE	8.4	● p.
3.	59.44	25.8	31.2	22.5	92.2	22.6	SE	.3	6.3	Ci.	Cu.		5.5	2 ● a. ● p.
4.	59.34	25.4	30.6	22.2	92.8	22.4	NE, E	.5	3.3	Ci.	Cu.		7.4	● a.
5.	59.52	25.2	31	23.4	95.3	22.7	SE, E	.3	4.3	Ci.	Cu.		37.8	2 ● a. 22 a. 22 a. 22 a.
6.	59.46	25.3	30	22.8	95.2	22.8	SSW	.5	5.7	Ci.-S.	Cu.-N.	ENE	26.4	2 ● a. ● p.
7.	59.25	26.2	31.3	23.4	91.8	23.2	SE	.2	8.3	Ci.-S.	Cu.	E		d° a.
8.	59.47	25.2	30.3	23.1	95.5	22.8	E	.3	5.7	Ci.-S.	Cu., N.	E, NE	42.4	d° a. ● a. ● p.
9.	59.49	25.6	31.2	22.8	91	22.2	Variable	.2	8.7	Ci.-S.	Cu., N.	E, NE		d° a.
10.	59.02	26.5	32.3	23	88.8	22.6	E, SE	1	8	Ci.-S.	Cu.	SE		1.2 p.
11.	59.24	25.6	31	20.9	87.3	21.1	E, SE	.8	6.3	Ci.	Cu.	E		
12.	59.88	25	30.1	21.8	93	21.9	ENE, SE	.5	4.5	Ci.-S.	Cu.	SE		
13.	59.79	25.6	31.7	21.6	86	20.6	Variable	.7	4.8	Ci.-S.	Cu.	E	.5	p° a. ● p.
14.	59.66	25	31.2	19.3	82	19	NE, NNE	.7	6.5	Ci.-S.	Cu.	N		
15.	60.32	25.5	31.2	21.4	88.5	21.3	N quad.	1.3	6.5	Ci.-S.	Cu.			
16.	60.94	24.7	30.6	21.7	92.8	21.5	NE quad.	.8	6.7	Variable	Cu.	E		
17.	60.35	25.5	32	22	89.7	21.7	NNE	1.3	4.5	Ci., Ci.-S.	Cu.	SE		
18.	60.86	25.8	31	22	91.5	22.6	Variable	1	3	Ci.	Fr.-Cu.	N		
19.	60.78	26.5	30.7	22.6	89.7	23	Variable	.4	3	Ci., Ci.-S.	Fr.-N.	NE		
20.	60.66	26.2	31.9	21.9	87.3	21.9	NNE	.5	3.3	Ci.-S., Ci.	Fr.-Cu.	E	1.3	p° a. p.
21.	60.19	25.8	30.7	22.8	93	22.9	SSE	1.5	3.3	Ci., Ci.-S.	Cu.-N.	E, ENE		
22.	59.48	25.9	30.2	21.9	92.3	22.8	NE, SE	.8	3.7	Ci.	Cu.	SE	1.8	d° a. ● p.
23.	60.60	25.4	31	20.8	89.7	21.6	NNE	.7	2	Ci.	Cu.	E	1.5	p° a.
24.	61	25.9	32.9	21.9	84.7	20.7	NNE	1	3.2	Ci.	Cu.	ENE		
25.	60.32	25.6	32	21.3	83.8	20.1	NE quad.	1.3	2.2	Ci.	Cu.	SE, ENE	2.3	
26.	58.49	25.6	31.4	21.7	88	21.2	SE quad.	.8	3.5	Ci.-S.	Cu.	SE, ENE		● d° a.
27.	57.94	25.5	30.3	21.4	88.8	21.5	SSE	1.2	3	Ci.	Cu.	ESE		2 d° a.
28.	58.59	25.7	30.8	21.3	87	21.2	Variable	1.3	3.8	A.-Cu.	Cu.	E		
29.	58.81	25.6	30.7	21.1	89	21.5	Variable	.8	2	Ci.	Cu.	ENE		
30.	59.22	25.9	30.9	22.6	92.5	23	NE	.8	2.2	Ci.	Cu.	SE		
								.5	4.5	Ci.-S.	Cu.	ESE	.5	p a.
Mean	759.69	25.6	31.1	22	90.2	21.9		.8	4.6					
Total													130.8	

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.		Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	759.50	26.3	30.5	22.8	87.5	22.1	E	199.1	5.5	A.-Cu.	SW	Cu.-N.	E	2	☉ p.
2.	59.38	25.9	30.6	23.9	91	22.6	ENE	192.2	5.3			Cu.-N.	E	20.8	☉ a. ☉ p.
3.	59.46	26.5	30.3	23	86.8	22.1	E	151.2	4	A.-Cu.	S	Cu.-N.			
4.	59.48	26.5	31	23.7	85.3	21.8	ENE	184.2	6.8	A.-Cu.	S	Cu.-N.	E	5.8	☉ ☉ p.
5.	59.47	26.5	30	23.9	88.2	22.5	E	192	7.2	Ci.	ESE	Cu.-N.	E	3.3	d° ☉ a.
6.	59.55	25.3	29.6	24.1	93.5	22.4	E, ENE	115.9	8.8	A.-Cu.	SE	Cu.-N.	E	33	☉ a. p. ☐ ☉ p.
7.	59.60	26	29	23.8	90.2	22.4	NE	185.8	9.2	A.-Cu.		Cu.-N.	E	3.5	d° a. d° p.
8.	59.54	25.5	29.8	23.9	94.7	22.9	NE	171.3	9.7			Cu.-N.	E	93.6	☉ a. p. ☐ ☉ p.
9.	59.18	26.4	31	23.9	88.3	22.4	E	131.4	9.2	Ci.-S., A.-Cu.		Cu.-N.	E	21.3	☉ a. p.
10.	58.98	26.6	29.6	23.6	85.7	22.1	ENE	228.9	7.3	Ci.		Cu.-N.	E	15.3	☉ a. ☉ ☐ p.
11.	59.26	24.8	28.8	22.9	92.5	21.5	Calm	102.1	7.8	Ci., Ci.-S.		Cu.-N.	E	30.7	☉ a. d a. p.
12.	59.87	26.2	29.6	23.2	86.7	21.8	NE quad.	204	6.2	Ci.		Cu.-N.	E		☉ a.
13.	59.60	25.2	30	22.3	83.7	19.9	NNW, SSW	117.6	7.8	Ci.-S.		Cu.-N.		1	d a. p.
14.	59.54	25.4	29.3	21.2	78	18.6	NNW, WSW	237.5	8.3	A.-Cu.	NE	S.-Cu.	N		
15.	60.03	26.2	30.5	22.1	77.3	19.5	NNW	191.1	6.8	Ci.-S.		Cu.-N.			
16.	60.53	25.8	30.6	22.1	83.2	20.5	NW, WSW	206.7	6	A.-Cu.		Cu.-N.		4.1	d p.
17.	60.20	26.8	30.7	23.4	83.5	21.7	NW	175.9	8	Ci.		Cu.-N.	N		☉ a.
18.	60.90	26.6	30	24.2	85.7	22.1	NNW	261	5.7	Ci.		Cu.-N.	N		d° a.
19.	60.86	25.6	31.7	23	91.3	22.2	NE, SE	156.5	5.8			Cu.-N.	NE	25.2	☉ p.
20.	60.86	26.1	30	23	87.2	21.8	NNE, NNW	150.5	5.5			Cu.-N.	NE	1.3	☉ a. d p.
21.	60.22	25.1	28.5	23.1	91.3	21.5	ENE, WSW	94.9	5.3	Ci.		Cu.-N.	NE	7.9	d° a. ☉ a. p.
22.	59.43	25.6	29.8	22.6	89.7	21.7	NE	205.5	8.5			Cu.-N.	NE	11.7	d a. p. ☉ p.
23.	60.45	27.4	30.6	24.1	81.6	22	NE quad.	289.6	4.3			Cu.-N.	ENE		d° a.
24.	60.93	27.2	30.8	23.3	78.5	21	E, ENE	276.4	2.5			Cu.-N.		.5	
25.	60.35	24.4	28	21.9	88.2	20	ENE	107.2	5.8			Cu.-N.	NE	1	d ☉ a.
26.	58.45	25.1	29.6	21.9	86.3	20.3	NW quad.	172.8	6	Ci.		Cu.-N.	NE		
27.	57.93	26.2	31.3	21.9	84.3	21.1	W quad.	108.2	2.8	Ci.		Cu.-N.			
28.	58.52	25.9	30.8	22.4	85	21	NNW	103.3	1.5	Ci.		Cu.-N.			
29.	58.72	26	30.3	22.3	85.5	21.2	Variable	131.1	1.3			Cu.-N.		.8	d p.
30.	59.12	26.3	31.2	22.9	85	21.4	E, ENE	148.5	5.2	A.-Cu.		Cu.-N.	E		d a.
Mean	759.66	26	30.1	23	86.5	21.5		173.1	6.1						
Total								5,192.4						282.8	

\* All the mean values given in these tables are deduced from six daily observations.

## Meteorological data for first and second class stations—Continued.

CEBU.<sup>a</sup>[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied, -1.84 mm.]

Day.	Pressure (mean).	Temperature.				Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1..	759.38	27.7	31	24.8	73.5	20.1	N, NE	291.6	4.2	Ci.	Cu.	ENE	0 a.	0 a.	
2..	59.50	28	31	25	73.8	20.6	N	320	3.8	Ci.	Cu.	ENE	0 a.	0 a.	
3..	59.44	27.8	31.1	25.2	76.8	21.3	N	325.1	2.8	Ci.	Cu.	ENE	0 a.	0 a.	
4..	59.40	27.6	31.4	25.1	78	21.3	NE	315.3	4.2	Ci.	Cu.	ENE	0 a.	0 a.	
5..	59.64	27	30	25.2	80.8	21.4	N quad.	298	6.8	Ci.-S.	Cu.-N.	ENE	10.2	0 a. $\angle$ p.	
6..	59.41	27.4	30.6	23.2	77.5	20.9	NE, N	302	6.8	Ci.-S., A.-Cu.	Cu.-N.	ENE	0 a.	0 a. $\angle$ p.	
7..	59.68	27.4	30.1	25.3	78.2	21.2	N, NE	327.1	6.8	Ci.-S.	Cu.	ENE	0 a.	0 a.	
8..	59.78	26.8	29.5	25	84	21.9	NE quad.	347	7.7		S.-Cu.	ENE	12	0 a. $\bullet$ p.	
9..	59.50	27.4	30.7	24.5	77.7	21	NE	272.6	6.8	Ci.-S.	Cu.	ENE		0 a. $\bullet$ a. $\cup$ p.	
10..	58.96	27.9	30.7	25.1	72.2	20.1	N, NE	419.7	2.7	Ci.	Cu.	ENE	0 a.	0 a.	
11..	59.33	27	31.4	24	71.7	18.8	NE quad.	336.3	3.5	Ci.	Cu.	ENE	0 a.	0 a.	
12..	59.88	27.2	31.8	23.7	72.2	19.2	NE	309.8	3	Ci.	Cu.	NE	0 a.	0 a. $\infty$ p.	
13..	59.68	27.1	31	24	68	18.1	N	410.6	3	Ci.	Cu.	ENE	0 a.	0 a.	
14..	59.72	26.6	30.5	22.9	62.3	15.9	N	342.6	4.5	Ci.	S.-Cu.	ENE	0 a.	0 a.	
15..	60.42	26.2	29.1	23	73	18.4	Variable	203.8	5.3	Ci.-S.	Cu.-N.	ENE	.8	0 a. $\bullet$ p.	
16..	60.80	26.3	31.5	22.8	77	19.5	N quad.	239.1	5	Ci., Ci.-S.	S.-Cu.	NE	0 a.	0 a.	
17..	60.37	26.6	30.4	23.7	76.2	19.6	N	225.4	5.7	Ci.	Cu.-N.	NNW	0 a.	0 a.	
18..	60.81	26.9	30.3	23.6	75.8	19.9	Variable	237.9	4.8	Ci.	Cu.	NE	1	0 a. $\bullet$ p.?	
19..	60.77	27.4	31.7	23.9	71.7	19.2	NE	353	2.7		Cu.	ENE	0 a.	0 a.	
20..	60.88	27.5	31.5	24	70.2	18.8	NE	376.5	3.8	Ci.	Cu.	NE	4.3	0 a. d° p.	
21..	60.23	27.2	31.2	23.5	74.8	19.8	NE	292.4	3.7	Ci.	Cu.	ENE	0 a.	0 a.	
22..	59.60	27.5	31.2	24.2	73.5	19.9	NE quad.	338	2.7		Cu.	ENE	0 a.	0 a.	
23..	60.74	27.2	31	24.2	70.3	18.8	N, NE	355.8	4		N.-cf.	NE	0 a.	0 a.	
24..	61.08	26.9	30.5	23.9	69.5	18.1	N	460.9			Cu.	ENE	0 a.	0 a.	
25..	60.47	26.6	31.3	23.8	67.2	17.4	N	488.4			Variable	ENE	0 a.	0 a.	
26..	58.68	27.2	30.3	24	70.7	18.8	NE	381.9			Cu.-N. NE	ENE	0 a.	0 a.	
27..	58.02	27.3	31.5	24.2	80.5	21.6	N			Ci.-S.	Cu.	NNW	0 a.	0 a.	
28..	58.56	26.8	31.9	23.4	78.2	20.4	N				Cu.	NE	0 a.	0 a.	
29..	58.92	27.4	32.1	23.5	74.8	20.2	Variable	190.8			Cu.	NE	0 a.	0 a.	
30..	59.37	26.4	30.4	24.5	80	20.4	N	181	c5		Cu.-N.	NE	0 a.	0 a.	
Mean	759.77	27.1	30.9	24.1	74.3	19.8		319.4	4.6						
Total													28.3		

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied, -1.84 mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
			Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.		
	Upper.	Lower.											
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1..	759.18	26.9	30.1	23.8	81.5	21.3	N	322.8	7.5	Ci.-S.	Cu.		☾ p.
2..	59.19	27.3	31.3	24.8	80.8	21.5	N, NE	411	5	Ci., Ci.-S.	Cu.		d a. ☾ T p.
3..	59.12	27.2	31.2	24.4	77	20.4	N, NE	343.7	4.5	Ci.	Cu.		d a. ☾ p.
4..	59.29	27.3	32	24.5	82	21.9	N	326.3	6.3	Ci., Ci.-S.	Cu., Cu.-N.	43.7	● ☽ ☾ p.
5..	59.40	26.8	30.6	24.8	83.7	21.7	N	393.9	8.3	Ci.-S.	Cu.-N.	NE	18.8
6..	59.25	27.2	30.9	24.3	81.2	21.6	N, NE	430.5	9.5	Ci.-S.	Cu., Cu.-N.		● a. ☾ ☾ p.
7..	59.08	27	31.3	24.8	81.8	21.5	N	455.5	7.8	Ci.-S.	Cu.		☾ d a. ☾ p.
8..	59.38	27.2	30.5	25.1	80.7	21.6	N	428.2	8.7	Ci.-S.	S.-Cu.	NE	☾ ● a. d p.
9..	59.12	27.1	30	24.6	79.7	21.1	N, NE	477.6	8.5	Ci., Ci.-S.	Cu.		● a.
10..	59.02	27.1	30.5	24.5	78.8	20.8	N, NE	516.6	4.2	Ci.	Cu.	NE	
11..	59.19	26.6	31	23.9	79.8	20.4	N	434.9	6.2	Ci., Ci.-S.	Cu.		
12..	59.88	27	31	24	75.2	19.6	N, NE	453	3.8	Ci.	Cu.		☉ a.
13..	59.90	25.6	29.4	22.9	79	19.1	N	379.2	6.8	Ci.	Cu.		☉ a. p.
14..	59.91	25.4	30	21.5	71.2	16.8	N	352.4	4.7	Ci.-S.	Cu.		☉ a.
15..	60.84	24.3	28.8	22.8	82.5	18.5	N	242	7	Ci.-S.	Cu.-N.	11.2	☉ a. d ● a. p.
16..	60.76	25.9	30.1	22.8	79.3	19.5	N, NE	308.4	8.5	Ci.-S.	Cu.		☉ a.
17..	60.31	26.2	30.5	23.6	77	19.4	N	321.7	7	Ci.	Cu.		☉ a.
18..	60.94	26	31	22.5	79.8	19.9	N	321.4	4.7	Ci.	Cu.		☉ a. d ☾ p.
19..	60.71	27.2	31.5	23.9	75.5	19.8	NE	374.3	3.5	Ci.	Cu.	NE	☉ a.
20..	60.93	26.8	31	23.5	77	20	NE	391	3.5	Ci.	Cu.	11.1	☉ a. ☾ ● p.
21..	60.24	26.1	30.5	23.3	79.5	19.7	NE	359.7	4	Ci., Ci.-S.	Cu.		● a.
22..	59.64	26.4	30.5	23.3	81.5	20.6	NE, N	420.1	4.2	Ci.	Cu.		☉ a. d p.
23..	60.64	26.6	30.9	23.5	78.2	20	N	495.2	1.8	Ci.	Cu.		☉ a.
24..	61.18	25.6	30	23	81.7	19.6	N	517	4		Cu.	4.8	☉ a. ● p.
25..	60.39	25.6	29.6	22.7	77.5	18.7	N	458.1	2.8	Ci.	Cu.		☉ a.
26..	58.80	26	31	22.8	75.2	18.5	NE	405.1	3.5	Ci., Ci.-S.	Cu.	NE	☉ a.
27..	57.77	26.2	30.1	22.6	79.5	19.9	N	149.9	4.3	Ci.	Cu.		☉ a.
28..	58.45	26.9	31.5	23.1	77.2	20.1	N	238.7	4.7	Ci.	Cu.		☉ a.
29..	58.72	27	31.5	22.6	78.7	20.7	NE	261	2.7		Cu.		☉ a.
30..	59.13	26.3	31.2	23	84	21.1	NE, N	293.9	4.5	Ci.-S.	Cu.	7.1	● d p.
Mean	759.68	26.5	30.6	23.6	79.2	20.2		376.1	5.4				
Total								11,283.1					105.8

<sup>a</sup> Some of the observations for pressure, temperature, relative humidity, and vapor pressure from November 24-30 are taken from the self-registering apparatus.<sup>b</sup> Deduced from four observations only.<sup>c</sup> Deduced from five observations.

*Meteorological data for first and second class stations—Continued.*

ORMOC.

[ $\phi=11^{\circ} 00' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.6 meters; gravity correction not applied,  $-1.83$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.	Total movement in 24 hours.	Amount (mean).	Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
	mm.	°C.	°C.	°C.	P. ct.						mm.	Prevailing direction.	Form and its direction.				Upper.	Lower.
1.	759.65	26	31.2	21.9	86	21.2	N quad.	Km.	120.9	0-10.	8.8	Cl.-S.	E	Cu.-N.	ENE	mm.	☉ a. p. T ☐ p.	
2.	59.57	26.4	31.6	22.4	85.8	21.6	Variable		122.5		6.3	Cl.-S.	E	Cu.-N.	E quad.	1	☐ d a. p. T ☐ p.	
3.	59.72	26.2	31.1	22.8	85.8	21.4	NW		132.3		5.8	Cl.-S.		Cu.-N.	E	3.6	☐ a. p. ☐ d ☐ p.	
4.	59.80	26.1	30.9	22.8	86.8	21.7	N quad.		106.8		7.5	Cl.-S.		Cu.-N.	E	2.8	☐ a. T a. p. d ☐ p.	
5.	59.86	25.9	31.6	23.4	90.3	22.4	N		132.3		8.5	Cl.-S.	E	Cu.-N.	E	.6	☐ a. p. p.	
6.	59.72	26	30.9	23.3	90.5	22.4	N, S		126.5		8	Cl.-S.	E	Cu.-N.	ENE	25.2	☐ a. T a. p. ● ☐ p.	
7.	59.86	27	29.3	24.3	82.3	21.7	S, NE		135.5	10		Cl.-S.		Cu.-N.	E		d a.	
8.	59.82	27.3	30	24.3	80.3	21.4	NE quad.		124.4		9.3	Cl.-S.		Cu.-N.	ENE	.3	p T a. ☐ p.	
9.	59.59	27	30.9	23.8	80.8	21.2	N, NE		139.9		6.3	Cl.-S.	E	Cu.-N.	ENE	1.3	☐ a. d ☐ p.	
10.	59.46	27.1	32.4	22.2	75.3	19.9	N quad.		132.7		5.5	Cl.-S.	SE by S	Cu.-N.	NNE	3.1	☐ d a. p. p.	
11.	59.56	25.3	30.7	21.7	83.7	20	NW		113.5		6.2	Cl.-S.	E by S	Cu.-N.	NE	2.8	☐ a. d a. p.	
12.	60.08	26.2	32.5	22.3	81.3	20.2	NW, W		149.7		4.7	Cl.-S.		Cu.-N.	ENE		☐ a.	
13.	60.06	24.8	29.8	20.2	81.7	18.9	NW quad.		141.3		5	Cl.-S.	SE	Cu.-N.	NNE, N		☐ a. ☐ p.	
14.	60.02	24	29.4	19	81.8	18.1	N quad.		168.3		6.8	A.-Cu.	NE	Cu.-N.	N		☐ a. ☐ p.	
15.	60.46	24.4	30.6	20.3	88.2	19.8	NW		144		9	Cl.-S.		Cu.-N.	N	24.2	● p.	
16.	61.02	25.1	29.1	23	84.8	19.9	NW		120.8		9.7	Cl.-S.		Cu.-N.	N	3	d a.	
17.	60.52	25.8	29.3	23	85.5	20.2	NE, NW		90.5		9.3	A.-Cu.	E	Cu.-N.	WNW	.3	d p.	
18.	61.08	25.9	30.7	23.1	87	21.6	NE quad.		98.9		9.7	A.-Cu.	E	Cu.-N.	E, NNE	2.8	☐ ☐ p. p.	
19.	61.15	25.5	30.8	21.4	85	20.3	N		108.7		5.5	A.-Cu.	ENE	Cu.-N.	E	10	☐ ☐ a. p. T ☐ ● ☐ p.	
20.	61.24	25.6	30.9	21.2	83.8	20.1	N quad.		132.2		4.8	A.-Cu.		Cu.-N.	E	14.5	☐ a. T ● d p.	
21.	60.48	25.8	31	22	85.5	20.9	N, S		112.5		4	Cl.-S.		Cu.-N.	E		☐ a.	
22.	59.67	26.9	33.1	22.5	73.5	18.9	NE quad.		139.1		3	Cl.-S.		Cu.-N.	NE		☐ p.	
23.	60.90	26.2	30.8	22.2	80	20.1	N, SW		163.9		5.7	A.-Cu.	ENE	Cu.	ENE		☐ p.	
24.	61.18	25.1	31.8	20.5	83.7	19.4	N		131.2		4.7	A.-Cu.	ENE	Cu.-N.	NE	22.1	☐ a. d ● T p.	
25.	60.48	25.6	31.7	21.8	76	18	N		134.4		3.3	Cl.-S.		Cu.-N.	NNE		☐ a. d p.	
26.	58.74	25.9	31.4	21.6	79	19.2	NW, N		163.4		6	Cl.-S.	SE	Cu.-N.	ENE	7.1	☐ ☐ a. ☐ d p.	
27.	58.32	25	29.6	21.7	91.8	21.6	NW quad.		91.4		8	Cl.-S.		Cu.-N.	NW, wnw	3	☐ a. d p.	
28.	58.85	25.2	30.5	20.3	84.3	19.8	NW		107.8		4.2	Cl.-S.		Cu.-N.	ENE		☐ ☐ a. ☐ p.	
29.	59	25.6	30.8	21.4	86.2	20.8	NW, N		131.1		4.8	Cl.		Cu.	NE	4.3	☐ ☐ a. T d ☐ ☐ p.	
30.	59.45	25.4	31	22.4	90	21.5	N		94.6		5.8	A.-Cu.	NE	Cu.-N.	ENE	24.9	☐ a. d ● p.	
Mean	759.98	25.8	30.8	22.1	83.9	20.5			127		6.5							
Total									3,811.1								156.9	

**TACLOBAN.**

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	mm.	°C.	°C.	°C.	P. ct.			mm.	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
												Upper.	Lower.		
1.	759.79	26.4	31.2	23	87.3	22.1	NW quad.	0.5	6	Ci.	NW, N	Cu.	SE	mm.	☉ <sup>2</sup> a. ↑ p.
2.	59.72	27	31.6	24.1	85.8	22.6	Variable	.7	5.7	Ci.-S.	W	Cu.	SE	0.5	☉ <sup>2</sup> d° a. ↙ p.
3.	59.78	27.2	32.4	23.6	83.7	22.1	Variable	.8	3.7	Ci.	WNW	Cu.	SE	2.8	☉ <sup>2</sup> ↙ a. ↙ p.
4.	59.92	26.4	29.4	24.1	87.8	22.4	WNW, SE	0	6.2	Ci.-S.		Cu.-N.	SE	2.5	☉ <sup>2</sup> a. d° ↙ p.
5.	59.98	26	28.5	24.2	90.7	22.6	NW, SW	.7	8.2			Cu.-N.	E	5.4	☉ <sup>2</sup> d a. p. ↑ p.
6.	59.66	26.5	31.4	24.5	86.3	22.2	NW quad.	1	8.5	Ci.-S.	N	Cu.-N.	E	7.4	☉ <sup>2</sup> a. p. d p.
7.	60.10	26	28.2	23.8	86.2	21.4	NW quad.	1.5	8.5	Ci.-S.		Cu.-N.	E, ENE	2.5	☉ <sup>2</sup> a. p. ↘ p.
8.	60.11	26.7	30.2	24.2	86.2	22.4	E	1.2	8.5			Cu.-N.	ENE	5.9	☉ <sup>2</sup> a. ↘ p.
9.	59.72	27.1	31	24	82.5	21.8	Variable	.3	7.5	Ci.-S.	SW	Cu.-N., Cu.	ENE	13.5	☉ <sup>2</sup> a. p. ↘ <sup>2</sup> p.
10.	59.49	26.2	31.6	24	84.3	21.3	Variable	1.2	6.8	Ci.		Cu.	ENE	3.3	☉ <sup>2</sup> a. ↘ <sup>2</sup> p.
11.	59.43	26.3	30	23.4	85.2	21.6	NW	.8	5.7	Ci.	SW	Cu.	ENE	11	☉ <sup>2</sup> ↘ a. a. p.
12.	60.13	27.2	32.6	24	79.8	21.1	E	1.2	4.3	Ci.	SSW	Cu.	NE	-----	☉ <sup>2</sup> a. ↘ <sup>2</sup> p.
13.	60	26.1	31.4	23.4	77.2	19.2	NW, WNW	1.2	6.3	Ci.	SW	Cu.	ENE	-----	☉ <sup>2</sup> ↘ <sup>2</sup> a. ↘ <sup>2</sup> a. p.
14.	59.82	24.6	29.4	21.6	82.7	18.9	NW	1.3	7	Ci.	SW	Cu.-N.	NE	3.8	☉ <sup>2</sup> ↘ <sup>2</sup> a. ● p.
15.	60.33	24.3	30.1	22.1	87.3	19.6	NW	2	8.2	Ci.		Cu.-N.	NE	11.9	☉ <sup>2</sup> a. ● p.
16.	60.92	24.4	26.5	23	88.8	20.2	NNW	1.7	8.2			Cu.-N.	N	1.8	☉ <sup>2</sup> a. ● p.
17.	60.40	25.2	29.6	23.1	85.8	20.3	WNW	1.3	8.3	Ci.	SW	Cu.	NE	17.5	☉ <sup>2</sup> a. ↘ <sup>2</sup> a. p. ● p.
18.	61.13	25	30.2	23	91.5	21.5	NW	1.3	8.8			Cu.-N., N.	NE	2.5	d a. ● a. p.
19.	61.20	25.4	31.6	23	89.8	21.6	NW, WNW	.7	7.2	Ci.-S.		Cu.	ENE	18.5	☉ <sup>2</sup> a. ● ↑ p.
20.	61.38	25	29	23	90	21	NW	1.2	7.8			Cu.-N.	NE	36.5	☉ <sup>2</sup> a. ● a. p. ↘ <sup>2</sup> p.
21.	60.49	26.6	32	23.4	84.2	21.5	NW quad.	.7	5.2			Cu.	NE	-----	☉ <sup>2</sup> a. ● p.
22.	59.80	27.2	32	23.7	78.7	20.9	NW	1.2	3.7			Cu.	NE	.8	☉ <sup>2</sup> a. ● p.
23.	60.90	26.5	31.2	22.5	82.2	20.8	SE	.5	3.2			Cu.	ENE	1.8	☉ <sup>2</sup> a. ● p.
24.	61.33	25.8	30.7	23.2	85.2	20.8	N	1.5	5.3			Cu.-N.	NE	9.7	☉ <sup>2</sup> a. ● a. p.
25.	60.61	26.2	30.4	23.2	75.7	18.9	NW, NNW	2.2	3.7			Cu.	NE	.8	☉ <sup>2</sup> d a. ● p.
26.	58.53	25.5	30	22.6	83.8	20.2	NNW, WNW	2	7.3	Ci.		Cu.-N.	NE	59.2	☉ <sup>2</sup> a. ● <sup>2</sup> p.
27.	58.12	26.3	30.6	22.4	86.3	21.7	Variable	.3	6.5	Ci.		Cu.	NE, ESE	.8	☉ <sup>2</sup> a. ● <sup>2</sup> p.
28.	58.78	26.7	32.4	22.8	82.8	21.3	SE	.3	3	Ci.		Cu.	E	-----	☉ <sup>2</sup> a. ● <sup>2</sup> p.
29.	58.94	27.1	32	23.8	84.8	22.5	NW quad.	.8	4.8			Cu.	ENE	-----	☉ <sup>2</sup> a. ● <sup>2</sup> p.
30.	59.44	26.3	31.2	24	85	21.4	WNW	.3	5.8	Ci.-S.	SW	S.-Cu.	ENE	27.2	☉ <sup>2</sup> p.
Mean	760	26.1	30.6	23.4	84.9	21.2		1	6.3						
Total														247.6	

**CAPIZ,**

Day.	Pressure (mean).		Temperature.				Relative humid-ity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours be-ginning 6 a. m.	Miscellaneous.	
	mm.	°C.	°C.	°C.	P. et.	mm.			Prevailing direction.	Total move-ment in 24 hours.		Form and its direction.				
												Upper.	Lower.			
1.	759.72	26.5	30.8	23.6	87.7	22.4	NE	121.6	0-10.	7.2	Variable	Fr.-N. ENE, E	mm.	☉ a. ☉ p.		
2.	59.77	27.4	31.9	24.6	83.7	22.6	NE	151		4.8	Ci.	Variable	NE	☉ ☉ p.		
3.	59.69	27.4	32	25	82.8	22.8	NE	158.1		4	Ci.	Variable	NE	☉ ☉ p.		
4.	60.01	27	31.7	24.5	87.3	23.1	NE	139.7		7.2	Ci.	Fr.-N. N.	NE	☉ ☉ p.		
5.	60.15	26.3	31.7	24.5	89.5	22.7	E	141.5		8.3	Ci., Ci.-Cu.	Fr.-N.	NE	☉ ☉ p.		
6.	59.93	27.4	32	25.1	87.2	23.4	NE	205.5		5.5	Ci.	Variable	NE	☉ ☉ p.		
7.	59.77	26.9	29.8	25.5	86.7	22.8	NE	169.6		9	Ci.-S.	N.	NE	☉ ☉ p.		
8.	60.28	26.2	30.8	24.4	91.2	22.9	E, NE	123.9		9	Ci.-S.	N.	E	12.9	☉ a. p. ☉ p.	
9.	59.51	27	31.3	25.1	84.7	22.3	NE	202.7		7.3	Ci.-S.	N.	NE	2.3	☉ ☉ p.	
10.	59.79	26.5	31.2	23.8	86.8	22.3	NE	150		6.3	Ci.	N.	NE	5.1	☉ ☉ p.	
11.	59.88	26.5	31.2	23.9	86.5	22.1	NE	134.9		7	Ci.-S.	Cu., N.	NE		☉ a. p.	
12.	60.41	27.1	31.8	24.7	81.5	21.6	NE	175.9		4.5	Ci.	Cu., Fr.-N.	NE	3	☉ ☉ p.	
13.	60.30	26.6	31.3	23.7	77.5	19.9	NE	241.5		7.2	Ci.	N.	NE		☉ a. p.	
14.	60.31	26.6	31	23.7	67.5	17.4	NE	317		6.2	Ci.	Cu.	NE			
15.	60.76	25.7	29.6	23.5	76.8	18.9	N	284.4		8.3	Ci.-S.	N.	NE	5.3	☉ a.	
16.	61.05	26.9	31	24.2	75	19.6	N	241.3		6	Ci.	Variable	N			
17.	60.70	26.6	30.8	23.5	79.3	20.4	N	193.4		4.2	A.-Cu.	N	N			
18.	61.30	27	31.5	24.6	81.5	21.5	N	200.6		4.8	Ci.	Cu.	N			
19.	61.32	27	31	25	84.3	22.3	NE	164.3		6.5	Ci.	N.	NE	3	☉ a. ☉ p.	
20.	61.63	26.4	31.6	23.8	84.8	21.6	NE	147.9		3.8	Ci., A.-Cu.	Cu.	NE	12.2	☉ ☉ d ☉ p.	
21.	60.87	26.2	31	23.7	86.7	21.7	NE	160.2		4.2	Ci., Ci.-S.	N.	NE			
22.	60.13	26.6	30.6	25.1	85.7	22.1	NE	246		7	Ci., Ci.-S.	N., Fr.-N.	NE	6.3	☉ a. p.	
23.	61.36	26	30.5	23.8	88.5	22.1	NE	286.2		6.7	Ci.	Fr.-N.	N	2	☉ a.	
24.	61.85	26.5	29.5	23.2	84.5	20.7	NE	259.1		8.3	Ci.	N., Fr.-N.	NE	6.9	☉ ☉ a. ☉ p.	
25.	61.24	26	30.2	23.5	76.3	19	NE	321.1		6.7	A.-Cu.	N.	NE	2.5	☉ a. p.	
26.	59.32	26.4	30.7	23	76.5	19.4	NE	222.8								

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.80$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.	
1.	759.74	25.5	31.7	21.8	86.7	20.9	N	0.8	6.7	Cl.-S.	S.-Cu.	NNE	4.6	☉ ● ☿ p.
2.	59.69	25.8	32.2	22.7	88.2	21.6	N	.5	7	Cl.-S.	Cu., Cu.-N. ENE		12.9	d° ● ☿ p.
3.	59.74	25.3	31.7	21.6	90	21.4	E, NW	.3	4.2	Cl.-S.	S.-cf., N.	NE	13.4	d a. p. ☿ p.
4.	60.02	24.8	30.1	22.9	91.8	21.3	N quad.	.7	8.3	Cl.-S.	S.-Cu.	E	28.7	● a. p. ☿ p.
5.	60.07	24.9	27.9	23	94.2	21.9	N quad.	.7	7.7	Cl.-S.	S.-Cu.		2.3	d a. p. ☿ p.
6.	59.80	26.6	32.2	23.5	86.8	22.2	NE quad.	1	6.8	Cl.-S.	S.-Cu.	NE	8.1	☉ ● a. ☿ p.
7.	60.09	25.5	31.5	23.8	91	22	NE	.7	9.7	Cl.-S.	S.-Cu., Fr.-N. E		6.1	● a. p. ☿ p.
8.	60.06	26.2	32.1	24	90.3	22.6	NE quad.	.8	9.2	Cl.-S.	N.	ENE	9.9	● a. p. ☿ p.
9.	59.70	26.2	32.8	23.2	87.7	21.3	NE	1	5.3	Ci.	Cu.			● a. d ☿ p.
10.	59.58	25.7	32.1	22.8	87.3	21.2	N quad.	1.3	3.8	Ci.	S.-Cu.	NE	.8	d a. e. p.
11.	59.64	25.6	32	21.5	86.8	20.9	NNE	.8	3.7	Cl.-S., Ci.	S.-Cu.	NE	2	d a. e. p.
12.	60.20	25.3	33.2	22.5	87.8	20.8	NNE	1	2.7	Ci.	Cu., S.-Cu.	NE	2.8	d a. e. p.
13.	60.22	24.2	31.1	20.9	86.5	19.1	N	1	5.5	Cl.-S.	S.-Cu.	NNE	2.1	● a. d ☿ p.
14.	59.77	24.2	30.3	19.2	81.3	18	N	1.2	4.8	Ci.	S.-Cu.	N	8.9	d a. p.
15.	60.34	24.7	30.9	22	89	20.5	N	.8	8.8	Cl.-S.	S.-Cu.	N	7.9	● d ☿ p.
16.	60.92	23.3	24.3	22.2	96.8	20.5	NNW	.8	10	Cl.-S.	N.		25.9	● a. p.
17.	60.41	25.7	31.2	22.6	86.2	20.9	N	.7	6.5	Cl.-S.	S.-Cu.	N		☿ p.
18.	61.32	25.1	28.5	22.8	90.8	21.4	NW	1	9.2	Cl.-S.	S.-Cu.	N	9.1	☉ ● ☿ a. d p.
19.	61.34	24.6	29.5	22.1	93.8	21.6	N	.7	6.5	Cl.-S.	Cu.-N.	NE	14.1	☉ ● a. ☿ p.
20.	61.47	24.7	31.7	21.3	89.3	20.6	N	.7	7	Cl.-S.	N.	NNE	2.5	● a. d p.
21.	60.50	25.8	32.6	21	83.3	20.3	N	1	2.2	Cl.-S., Ci.	Cu.	NE		☉ p.
22.	60.04	25.9	32.2	21.8	85	20.7	N quad.	1	2.5	Cl.-S.	S.-cf., Cu.-N.	NE	.8	d a. p.
23.	61.06	25.5	32.4	21.8	85.7	20.6	N	1	2	Cl.-S.	Cu.	ENE		● a. p.
24.	61.55	24.6	31.4	20.8	86.7	19.8	N	1.2	5.2	Cl.-Cu.	Cu.	N	2.5	● a. d p.
25.	60.79	25.2	31.8	20.4	80.8	18.9	N	1.2	3.7	Cl.-S.	Cu.	N	1	● a. d p.
26.	58.62	25.3	31.6	22.2	87	20.6	NW	1	5.7	Cl.-S.	S.-Cu.	NNW	9.2	● a. d p.
27.	57.78	26.1	29.2	23.4	87.8	22	Variable	.8	5.3	Cl.-S.	Cu.-N.			● a.
28.	58.78	25.1	30.9	21.2	89.3	21	N	1	3.5	Cl.-S.	Cu.	NNE	19.8	● a. p. ☿ p.
29.	58.82	26	32	22	88.8	22	N quad.	.8	3.8	Ci., Cl.-S.	Cu.-N.	NE	5.1	☉ ● ☿ p.
30.	59.55	25.5	31.3	22.6	90.7	21.9	N	1	7.5	Cl.-S.	Cu.-N., N. NE, NNE		6.8	● d° ☿ p.
Mean	760.05	25.3	31.1	22.1	88.1	21		.9	5.8					
Total													207.3	

## Meteorological data for first and second class stations—Continued.

## LEGASPI.

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction. Upper. Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.		mm.	
1.	760.20	26	29	23.3	87	21.6	NNE	201.1	8	Ci.-S.	Fr.-N. E, ENE	d° a. p.
2.	60.04	27.7	31.2	25.1	82	22.6	NE	235.4	8	A.-Cu.	Cu. ENE	0.3
3.	60.07	27.5	34.4	24.9	83.7	22.6	NE	196.6	4.3	Cu.	ENE	16.6
4.	60.30	26.3	28.5	24.6	88.3	22.4	NE	173.8	9	Ci.-S.	Fr.-N. ENE	5.6
5.	60.38	25.6	26.5	24.4	90.8	22.1	NE	205.1	9.2	Ci.-S.	N. ENE	24.4
6.	60.07	27.6	32.3	25.4	83.7	23	NE, NNE	274.3	4	Ci.-S.	Cu.-N. E	2.5
7.	60.38	28	32	25.7	84.7	23.7	NE, NNE	284.3	7.2	Ci.-S.	Cu.-N. ENE	5.8
8.	60.48	27.1	29.6	24	87.5	23.2	NE quad.	371.6	8.7	Ci.-S.	Fr.-N. E, ENE	25.1
9.	60.17	27.5	32.4	25.6	82.7	22.4	NE	282.8	5.7	Ci.-S.	Cu. ENE	3
10.	59.88	27.7	30.8	24.7	79	21.7	NNE	295.1	7	Ci.	Fr.-N., Cu. ENE, NE	1
11.	60.08	26.4	30.5	22.7	85.3	21.7	NNE	194.7	2.3	Ci.	Cu. ENE	5.9
12.	60.59	27.6	32.5	24.8	82.3	22.4	NE	265	3	Ci.	Cu. ENE	3
13.	60.51	26.5	29.3	23.6	72.7	18.7	NE, NNE	325.1	4.5	Ci.	Cu. NE, NNE	3
14.	60.26	25.8	30.2	21.6	72.3	17.8	N		3.8	Ci.	Cu. N, NNE	4.3
15.	60.52	25.7	29.6	22.9	84.7	20.6	NE quad.	316.2	5.7	Ci.-S.	Cu. NNE	3
16.	60.75	26.8	30	24.8	73	19.1	NE, NNE	363.6	5.8	Ci.-S.	Cu.	3
17.	60.40	26.7	30.8	20.6	74.8	19.4	NNE	261	1.8	A.-Cu.	NW	
18.	61.27	26	31.2	21.5	84.7	20.9	NNE	260.1	3.3	Ci.	N	2
19.	61.33	26.8	30.3	24.7	89.2	23.2	NE, NNE	184.6	6.2	Ci.	Fr.-N. NNE, NE	15.9
20.	61.66	27.4	31.1	23.6	81.3	21.9	NE quad.	235.2	3.2	Ci., Ci.-S.	Cu. ENE	4.6
21.	60.84	26.4	31.3	23.4	86.3	22	NNE	169.2	7.2	A.-Cu.	ESE	13
22.	60.50	26.4	31.2	24.1	86	21.8	NNE	238.5	6.8	Ci.-S.	N. NE	19.9
23.	61.78	24.5	26.3	23.4	89.3	20.4	NE, NNE	151.8	8.8	Ci.-S.	Fr.-N. ENE	66
24.	61.88	25.3	28.1	23.5	81.3	20	NNE	362.6	6.5	Ci.-S.	Cu.-N. NE	
25.	61.25	25.3	28	23.3	82.7	19.8	NNE		4.7	Ci.-S.	Cu. NNE, NE	2.5
26.	58.69	26.1	30.3	23.5	77.7	19.5	NE quad.	190.6	4.8	A.-Cu.	Fr.-N. NE	16.3
27.	57.49	25.1	27.8	23.7	94.8	22.4	SSW	34.3	7.2	Ci.-S.	N. SSE	37.5
28.	59.10	26.4	31.6	23.9	87.7	22.3	NNE, NE	48.9	3.3	A.-Cu.	Cu. ENE	2.8
29.	59.21	26.6	31.1	22.1	85.7	22	NNE	61.1	2.2	A.-Cu.	Cu. E	10.4
30.	59.98	25.4	27.4	23.6	90	21.8	NE	103.7	7.8	Ci.-S.	Fr.-N. NE	35.8
Mean	760.34	26.5	30.2	23.8	83.7	21.4		224.5	5.6			
Total												319.1

## ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction. Upper. Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.		mm.	
1.	760.46	26.4	27.8	23.5	86	21.9	NE	340	9.3	Ci.-S.	S.-Cu. NE	≡° a. d° <° p.
2.	60.38	26.7	29.3	25.5	86.7	22.5	NE, N	421.2	8.3	Ci.	S.-Cu. NE	d° a. <° p.
3.	60.44	27.4	29.5	25.7	83.2	22.6	NE	346.8	4.8	A.-Cu.	Cu. NE	2.5
4.	60.37	26.6	27.8	25.2	89.2	23.1	N	379.2	8.7	Ci.-S.	S.-Cu. NE	1.6
5.	60.63	26.6	28.9	23.3	87.8	22.7	NE, N	289.9	7.2	Ci.	N., S. NE	22.1
6.	60.68	27.1	29.5	24.9	87.7	23.3	NE	401.9	7.8	Ci.	S.-Cu., N. NE	45.7
7.	60.99	26.8	27.9	23.7	88.3	23	NE	484.7	9.7	Ci.-S.	S.-Cu. NE	8.2
8.	61.07	26.7	27.9	25	87.7	22.9	NE	608.6	9.8	Ci.-S., Ci.	N. NE	18.1
9.	60.67	27	28.4	25	86.7	22.8	NE	480.7	8.7	Ci.	S.-Cu. NE	d° a. p. <° p.
10.	60.60	26.5	28.2	24.8	86	22	NE		7	Ci.	S.-Cu. NE	28.7
11.	60.63	26.3	28	24.1	85.8	21.7	NE	547	7	Ci.	Variable NE	9.7
12.	61.02	26.6	28.5	24.6	82	21.2	NE	442.7	7.7	Ci.	S.-Cu. NE	1.3
13.	61.08	26.6	28.1	25	73.2	19	NE	654.7	7.3	A.-Cu.	S.-Cu. NE	2
14.	61.27	26.5	28	23.9	66.3	17.1	NE	865.7	7	Ci.	S.-Cu. NE	2
15.	61.52	25.8	28.6	23.6	78.7	19.3	N	791.5	8.2	A.-Cu.	S.-Cu. NE	12.2
16.	61.80	25.5	26.6	23.7	81.8	19.8	NE quad.	731.1	9.3	A.-Cu.	S.-Cu. NE	4.8
17.	61.15	26.3	28.5	23.6	75.7	19.2	NE	560.1	6.3	A.-Cu.	Cu. NE	2.8
18.	61.97	26.7	28.8	24.3	78.7	20.4	NE, N	538.5	6.2	A.-Cu.	S.-Cu. NE, N	2.3
19.	62.22	26.7	26.9	24.4	88	21.6	NE quad.		10	Ci.	N. NE	56.6
20.	62.27	26.6	29	24.1	86.2	22.2	NE	477.2	5.8	A.-Cu.	S.-Cu. NE	11.9
21.	61.75	25.8	26.7	23.2	86	21.2	N	677.4	9.7	Ci.	N. NE	24.9
22.	61.42	25.4	26.6	23.4	85.2	20.6	NE	920.8	9.5	Ci.	N. NE	9.7
23.	62.58	26.3	27.4	24.4	80.2	20.4	NE	886.8	9.5	A.-Cu.	S.-Cu. NE	3
24.	62.88	26.1	27.8	24.2	73.5	18.5	NE	1,018.7	7.3	Ci.	S.-Cu. NE	1
25.	62.32	26.3	27.6	24.5	69.3	17.6	NE	905.8	5.8	A.-Cu.	S.-Cu. NE	3
26.	60.22	26.4	28.8	24	73.5	18.7	N	831.7	5.5	Variable	Cu. NE	21.3
27.	57.37	24.3	26	22.5	93.2	21.1	Variable	572.3	10	Ci.-S.	N. Variable	107.2
28.	59.13	25.3	28.6	22	88.3	21.2	W	288	5.3	A.-Cu.	S.-Cu., Cu. NE, SE	10.7
29.	59.42	25.9	27	24.4	88.8	22	N	543.9	9.5	A.-Cu.	S.-Cu. NNE	31.8
30.	60.17	26.1	28.7	23.6	85.8	21.5	NE	479.8	6.5	Ci.	S.-Cu. NE	6.1
Mean	760.95	26.3	28	24.1	83	21		588.8	7.8			
Total												444.2

\* From the 7th, 2 p. m., the barometric readings are taken from an aneroid barometer (barocyclonometer).



## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5 \* meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.					mm.
1.	759.89	26.2	30	23.5	82	20.7	NE	2.2	8.2	Ci.-S.	SSE	S.-Cu.	SE	
2.	59.72	27.1	31	24	79.2	21.1	NE	2.2	6.3	Ci.-S.		Cu.	SE	
3.	59.93	27.2	31.5	24	78.8	21	NE	2.2	5.7	Ci.-S.	NE	Cu.	SE	< p.
4.	60	25.8	27.6	24	85.3	21.1	NE	2	8.2	Ci.-S.	NW	N., S.-Cu.	SE	3.8
5.	60.18	26.4	30.3	24	86	21.9	NE	1.8	8.8	Ci.-S.	SW	N., Cu.-N.	SE	2.3
6.	59.87	27.4	32	24	80.2	21.6	NE	2	8.2	Ci.-S.		S.-Cu.	SE	
7.	60.28	27	30.5	25	80.3	21.4	NE	2.3	8.5	Ci.-S.	NW	S.-Cu.	SE	
8.	60.45	26.8	30	24.6	84.3	22	NE	2.2	7.2	Ci.-S.		S.-Cu., Cu	SE	1.3
9.	60.16	27.2	31.2	24	80.7	21.4	NE	2.2	7.7	Ci.-S.		Cu.	SE	3.8
10.	60.02	25.7	29	22.8	83.2	20.4	NE	2	7.5	Ci.-S.	NNE	S.-Cu.	SE	
11.	60.19	26.1	30.4	22.6	79.2	19.6	NE	2.2	6	Ci.-S.	E	Cu.	SE	
12.	60.51	26.6	31.3	22.5	77.3	19.7	NE	2.2	6.5	Ci.-S.		Cu.	SE	
13.	60.73	25.4	30.4	20.2	78.8	18.8	NE	1.8	5.7	Ci.-S.	ENE	Cu.	SE	
14.	60.86	24.5	29.6	19	77	17.3	NE	1.8	5.3	Ci.-S.	ENE	Cu.	SE	
15.	61.51	24.4	31	19.4	79.7	17.8	NE	1.3	6.7	Ci.-S.		Cu.	SE	1.3
16.	61.47	25.2	29	21.9	79.7	18.8	NE	1.5	6.3	Ci.-S.		Cu.	SE	
17.	60.73	25.6	30.7	21.9	77	18.3	NE	1.7	5.3	Ci.-S.	E	Cu.	SE	
18.	61.46	25.6	31	21.5	75.5	18.1	NE	1.3	6	Ci.-S.	E	Cu.	SE	1.5
19.	61.69	25.5	30	23.2	84.3	20.4	NE, ENE	1.5	8.2	Ci.-S.		S.-Cu.	SE, E	4.8
20.	61.86	25.8	31	23.1	83.3	20.5	NE	1.5	6.8	Ci.-S.		Cu.	E	1.3
21.	61.30	25.9	30	22.3	81.5	20.2	NE	1.8	7.7	Ci.-S.	ESE	S.-Cu.	E	
22.	60.64	25.2	26.7	23.5	81.7	19.4	ENE	2.5	7.5	Ci.-S.		Variable	E	4.1
23.	61.72	25.7	29.4	23	78.5	19.2	NE	2.5	8.2	Ci.-S.		S.-Cu.	E	
24.	62.16	25.6	29.2	23.3	73.7	17.9	NE	2.8	6.2	Ci.-S.		Cu.	E	
25.	61.68	25	29.9	21.5	75.7	17.6	ENE	2.3	6.2	Ci.-S.		Cu.	E	
26.	59.66	25.8	30.9	22	72.3	17.6	NE	2.3	6.8	Ci.-S.		Cu., S.-Cu.	E	
27.	57.82	24	27	22	88	19.5	NE quad.	.8	9.2	Ci.-S.	NE, NNE	S.-Cu.	E	.5
28.	58.70	25.7	30.8	21.9	84.5	20.7	NE	1	6	Ci.-S.	ENE	S.-Cu.	E	
29.	59.31	26	31	22	81.7	20.3	NE	1.7	5	Ci., Ci.-S.		Cu.	E	
30.	59.88	26.3	31	23	80.8	20.3	NE	1.7	5.5	Ci.-S.	NE	Cu.	E	
Mean	760.48	25.9	30.1	22.7	80.3	19.8		1.9	6.9					
Total														24.7

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.			Lower.	
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.		
1.	760.77	25.2	28	23.8	91.8	21.8	E	111.3	10	Ci.-S.		Cu., S.-Cu. ENE	11.9	● a.
2.	60.62	27.2	30.8	25	86.8	23.2	E	218.4	6.3	Ci.		Cu. NE	5.6	●° a. p.
3.	60.68	26.3	30	23.5	90.3	22.9	ENE	166.9	6.8	Ci.-S.		S.-Cu. ENE	24.4	● a. p.
4.	60.75	25.8	29	24.5	94.3	23.4	E	145.1	9.5	Ci.-S.		S.-Cu. ENE	11.5	● a. p.
5.	60.90	26.2	29.3	24	93.5	23.6	ENE	141.8	9	Ci.-S.		Cu., S.-Cu. ENE	18.3	● a. p.
6.	60.72	27	30.8	24.5	90	23.8	ENE	330.8	7	Ci., Ci.-S.		Cu. ENE	3.8	● a. p.
7.	61.10	26.8	28.4	24.2	90.8	23.8	ENE	372.8	8.5	Ci.-S.		Cu. ENE	10.1	● a. p.
8.	61.45	27.4	29.6	25.1	87.3	23.6	ENE	505.5	9.3	Ci.-S.		Cu. ENE	9.9	● a. p.
9.	60.97	26.5	28.8	24.7	87.7	22.6	ENE	284.4	8	Ci.-S.		Cu., S.-Cu. NE	7.1	● a. p.
10.	60.70	26.6	29.2	24	86.2	22.2	ENE	326.3	7.5	Ci.		Cu. NE	25	●° p.
11.	60.71	26.8	29.8	23.9	84.5	21.8	ENE	334.2	7	Ci.		Cu. NE	8.1	● a. p.
12.	61.24	27	30.8	24.5	80.8	21.4	ENE	244.1	6.7	Ci.		Cu. E	3.8	d ● p.
13.	61.44	26.2	29.2	24.4	73.2	18.5	ENE	410.3	6.5	Ci.		Cu. NE	2.3	● a.
14.	61.37	26.7	28.8	24	65.3	17	NE	461.9	6.5	Ci.		Cu. NE		●° a.
15.	61.54	27.1	29.6	24.9	67.2	17.8	NE	442.2	6	Ci.		Cu. NE	.3	
16.	62	26.3	29.2	24.1	75.8	19.2	NE	364.4	10	Ci.-S.		S.,Cu. NE	1.8	d° ●° a. p.
17.	61.38	26.7	29.6	24	72.8	19	NE	281.3	7.2	Ci.		Cu. NE		●° a.
18.	62.20	27.1	29.2	25.3	77.8	20.8	NE	287.7	9.3	Ci.-S.		Cu. NE	2.3	●° a.
19.	62.37	25.2	27	23.9	95.2	22.6	NE	358	10	Ci.-S.		S.-Cu. NE	50.8	●° a. p.
20.	62.50	27.4	30.3	24.8	84.7	22.9	NE	300.7	7.5	Ci.-S.		Cu. NE	10.4	●° a. p.
21.	61.92	26	29	24.4	89.3	22.2	NE	380.8	7.8	Ci., Ci.-S.		Cu. NE	84.4	●° a. p.
22.	61.67	25	26.7	20.8	91.8	21.5	NE	438.7	10	Ci.-S.		S.-Cu., N. NE	54.1	●° a. p.
23.	62.78	26.4	29.2	23.3	82.3	21.1	NE	470.6	10	Ci.-S.		Cu. NE	32.3	●° a. p.
24.	63.33	26.3	28.2	25	71.2	18.2	NE	592.9	5.3	Ci.		Cu. NE	2	d a. p.
25.	62.36	25.7	28.2	23	72.7	17.9	NE	424.8	7.3	Ci.-S.		Cu. NE	.8	d° ● p.
26.	60.12	26.4	29.3	24.5	75.3	19.2	NE	366.2	7.5	Ci.-S.		Cu. NE	36.4	d ● p.
27.	57.32	25.4	26.7	23.3	91.7	22.2	ENE	349.3	9.3	Ci.-S.		S.-Cu. E	43	●° a. p.
28.	59.62	25.7	30	22	90	22	ENE	151.6	4.8	Ci.		Cu. E	6.3	●° a. p.
29.	59.73	26	29	24	90.7	22.7	ENE	224.7	8.5	Ci.-S.		Cu. ENE	14	●° a. d ● p.
30.	60.46	26.5	29.5	23	85	21.7	ENE	222.6	7	Ci., Ci.-S.		Cu. ENE	1.3	● a.
Mean	761.16	26.4	29.1	24	83.9	21.4		323.7	7.9					
Total								9,710.3					482	

\* This is an approximate height of the barometer above sea level.

## Meteorological data for first and second class stations—Continued.

## SAN ISIDRO.

[ $\phi=15^{\circ} 22' N$ ;  $\lambda=120^{\circ} 53' E$ ; barometer above sea, 20 meters; gravity correction not applied,  $-1.69$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.		
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.		
1.	760.96	23.4	24.4	21.5	96.8	20.7	N, E	1.2	8.3	Cl.-S.			E	19.3	d ● a. p.
2.	60.54	25.8	31	21.4	81.3	19.8	N, E	1.7	3.5	A.-Cu.			E		☐ p.
3.	60.80	25.5	30.3	21.4	83.7	20.2	N	2.2	4.2	A.-Cu.	E, ESE		E	1	☐ a. ☐ p.
4.	61.02	24.3	25.7	22.4	95.2	21.4	NE	1.2	8.2	Cl.-S.			E	3.5	d a. p.
5.	61.03	24.4	26.8	22.1	94.8	21.4	NE	1.8	6.7	Cl.-S.			ESE	2.8	d a. d a. p.
6.	60.82	25.2	29.4	22	90.3	21.5	NE	1.3	6.8	Cl.-S.			ENE	5	d a. ☐ p.
7.	61.08	26.2	31.8	21.5	78.7	19.5	N, E	2.8	3.8	Cl.	SE		E		☐ a. ☐ p.
8.	61.30	26	31	21.6	81.8	20.1	NE	2	5	Cl.			E		☐ a. ☐ p.
9.	61.07	26.3	32.5	21.6	79.7	19.8	E	2.3	4.8	Cl.			E		☐ a.
10.	60.67	25.9	30.6	21.6	81	19.9	E	1.8	3.8	Cl.	E		E		☐ a.
11.	60.72	25.9	31.8	21.7	78.8	19.1	NE	2.3	2.5	Cl.	NE, ENE		E		☐ a.
12.	61.15	25.7	32	19.7	77.7	18.6	N, ESE	2.3	3.3	Cl.			E		☐ a. d° p.
13.	61.26	25.2	30.9	21.4	79.7	18.3	ESE	2	4.8	Cl.			NE		☐ a. ☐ p.
14.	61.53	24.2	30	19.2	75.2	16.5	NE	2.5	4	Cl.	SE		ENE		☐ a. ☐ p.
15.	61.84	24.2	31	17.4	77	17	NE	2	4.3	Cl.	SE		ENE		☐ a.
16.	61.79	25.3	30.5	20.1	79.2	18.8	NE	1.8	4.2	Cl.	SE		NE quad.		☐ a. ☐ p.
17.	61.23	25.4	30.4	19.8	77.5	18.5	E quad.	2	4	Cl.	ESE		E		☐ a. ☐ p.
18.	62.17	25.7	31.3	20.9	75.8	18.2	NE	2.3	4.8	Cl.			E		☐ a.
19.	62.39	26.2	31.8	21.4	79	19.8	N, E	2.3	4.5	A.-Cu.	E		ENE		☐ a.
20.	62.63	25.3	31.1	21.4	86	20.4	E quad.	1.8	4.5	Cl.			E	11.2	☐ a. ● ☐ p.
21.	61.90	25.6	31.8	19.8	81	19.4	E, N	2	3	A.-Cu.	E		E		☐ a.
22.	61.47	25.8	31.2	21	75.8	18.4	NE, N	2.7	2.7	Cl.			E		☐ a.
23.	62.54	25.5	31.9	21.5	75.2	17.8	E, N	2.7	5.2	Cl.			E		☐ a.
24.	62.90	24.6	30	19.2	75.8	17	N	2.7	2.7	A.-Cu.	ENE		E		☐ a.
25.	62.66	23.6	29.4	17.6	73.7	15.6	N, NE	2.5	3.3	A.-Cu.	ENE		E		☐ a.
26.	60.48	24.4	30	18.9	73.7	16.3	N, NE	2	5	A.-Cu.			E		☐ a.
27.	58.86	23.8	27.8	20.9	86.2	18.8	NNE, NE	2.5	8	Cl.-S.			NE	1.3	d a. p.
28.	59.67	25.6	30.6	22.2	79.3	19.1	E	3	7	Cl.-S.			ENE		d° a.
29.	59.88	25.7	31.8	19.9	78.2	19	N	2	2.5	Cl.			NE		☐ a.
30.	60.37	26	31.5	20.6	78	19.3	N, SE	1.7	3.5	Cl.			E		☐ a. ☐ p.
Mean	761.22	25.2	30.3	20.7	80.9	19		2.1	4.6						
Total													39.6		

## DAGUPAN.

[ $\phi=16^{\circ} 03' N$ ;  $\lambda=120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied,  $-1.67$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	759.78	26.6	33.2	23.9	78.7	20.2	SE, S	209.6	7.5	A.-Cu., A.-S.	S.-Cu.		☐ a. d p.
2.	59.67	27.5	34.8	22.9	75.3	20.2	SE quad.	195.4	5.5	A.-Cu.	S.-Cu.		d <sup>2</sup> p.
3.	59.84	27.4	35.6	22.6	78.2	21	SE quad.	152.2	4	Cl.	Cu.-N.	ESE	☐ a. ☐ p.
4.	59.92	26.7	33.9	22.6	79	20.4	SE	167.1	5.2	Cl.	S.-Cu.		
5.	60.04	27.3	35.3	22.7	80	21.2	SE	146.7	5.7	Cl.	Fr.-N.	ESE	2.8 ● ☐ a. p.
6.	59.89	27.6	34.5	22.9	80.2	21.6	SE	149.4	5.7	Cl., Cl.-S.	Fr.-N.	E	
7.	60.13	27.6	35.8	23	76.2	20.7	S, NNW	191.8	3.2	Cl.	Cu.		☐ a.
8.	60.38	27.7	36.1	22.5	74	19.8	SE	166.2	3.5	Cl.	Cu.		☐ a.
9.	60.14	26.7	34.8	22	76.7	19.6	E, N	145.7	5	Cl.	S.-Cu., Cu.		☐ a.
10.	59.45	27.9	34.9	22.6	71.8	19.7	SE	246.4	2.8	Cl.	S.-Cu.	E	☐ a.
11.	59.84	27.2	34.3	22.9	73.2	19.4	S	135.2	1.5	Cl.	Cu.		☐ a.
12.	60.24	27	32.9	21.1	73	18.9	SE	186.6	1.5	Cl.	Cu.		☐ a.
13.	60.38	26.8	33.7	22.5	72	18.6	S	162.1	5.8	Cl.	S.-Cu.	E	☐ a.
14.	60.32	26.4	34.1	21.3	65.3	16.3	SSE	268.9	5.3	Cl.	S.-Cu.	E	☐ a.
15.	60.96	26.2	32.5	19	64.5	16	S, NW	218.2	4.5	A.-Cu.	Cu., S.-Cu.		☐ a.
16.	61.04	26.6	32.5	20.6	72	18.2	NW quad.	187.2	4.3	Cl.	S.-Cu.		
17.	60.34	27	32.3	22.9	74.7	19.6	N quad.	200.7	4.7	Cl., A.-Cu.	S.-Cu.		☐ a.
18.	61.36	27.4	34.7	22.9	70.7	18.7	SE quad.	182.1	5.8	A.-Cu.	S.-Cu.		☐ a.
19.	61.73	26.4	32.8	21.4	77.2	19.3	NW	155.1	.3	Cl.	Cu.		☐ a.
20.	61.77	27.2	34.4	22.1	77	20.3	Variable	153.2	2.3	Cl.	Cu.		☐ a.
21.	61.18	26.7	32.4	22	75.5	19.4	Variable	176.5	.3	Cl.	Cu., S.-Cu.		☐ a.
22.	60.48	26.2	31.8	21	78	19.4	Variable	183.4	.3	Cl.	Cu.	☐ a.	☐ a.
23.	61.65	26.8	34.8	22.1	73.2	18.9	S	226.4	.7	Cl.	Cu.		☐ a.
24.	61.75	26.6	34.9	21	67.7	17.1	S	205.3	.2	Cl.	Cu.		☐ a.
25.	61.62	25.2	32.5	20.6	66	15.6	S quad.	239.3	.3		Cu.		☐ a.
26.	59.71	25.5	33.3	19.1	72.3	17.2	N	175.2	.8		Cu.		☐ a.
27.	58.09	26	31.3	21	75.8	18.6	N quad.	119.4	5.7	Cl.-S.	S.-Cu.		☐ a.
28.	58.63	25.9	33.5	22.5	77.3	19.2	SE	162.8	6.8	A.-S.	S.-Cu.		☐ d° a. d p.
29.	59.25	26.6	32.3	21.4	76.3	19.4	SE	191.3	1.7	Cl.	Cu.		☐ a.
30.	59.57	26.8	32.2	22.5	79.2	20.4	NW quad.	169.5	.5	Cl.	Cu.		☐ a.
Mean	760.30	26.8	33.7	21.9	74.4	19.2		182.3	3.4				
Total								5,468.9				2.8	

## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi=16^{\circ} 24' N$ ;  $\lambda=119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied,  $-1.65$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				
1.	759.82	26.8	32.9	23.5	73.5	20.4	SSE	2.8	10	Ci.-S.	S.-Cu.	mm.	
2.	59.91	27.8	32.5	24.1	70.5	19.5	SSE	4	10	Ci.-S.	S.-Cu.		
3.	60.14	27.8	33.3	23.9	77.5	21.3	S	2.7	6.5	Ci.-S.	S.-Cu.	0.5	
4.	60.12	27.1	33.3	22.4	78.8	20.7	SE quad.	2.3	6.5	Ci.-S.	S.-Cu., Cu.		
5.	60.32	27.7	32.9	22.9	79.7	21.6	SSE, S	3	7.3	Ci.	S.-Cu.		
6.	60.15	27.5	31.1	24.1	81.3	21.8	S	2.2	7.8	Ci.-S.	S.-Cu.	3	
7.	60.50	27.6	32.9	23	79.3	21.4	S	2.8	7	Ci.-S.	S.-Cu., Cu.		
8.	60.64	27.6	33.1	22.4	79.3	21.5	S	2.7	5.3	Ci.-S.	S.-Cu.		
9.	60.48	27.3	33.3	22.6	78.2	20.8	NNE	3	6.5	Ci.-S.	S.-Cu.		
10.	59.74	27.5	32.6	22.3	78	21	N, S	2.3	8.5	Ci.-S.	S.-Cu.		
11.	60.11	27.2	32.9	21.9	74	19.5	SSE	3	7.3	Ci.	S.-Cu.		
12.	60.51	26.9	32.1	22.4	75.7	19.7	S	2.8	3.7	Ci., Ci.-S.	S.-Cu.		
13.	60.69	26.7	32.1	21	73	20	S	2.5	9	Ci.-S.	S.-Cu.	.3	
14.	60.48	27.3	32.1	22.9	65.2	17.2	SE quad.	3.7	9.5	Ci.-S.	S.-Cu.		
15.	61.22	25.6	32.1	19.8	73.7	17.6	SSE	2	9.5	Ci., Ci.-S.	S.-Cu.		
16.	61.37	26.8	31.8	21.1	73.7	19.1	NNE	3.7	7.8	Ci.-S.	S.-Cu.		
17.	60.86	27.7	31.1	25.4	66.3	18.2	NNE	4	5.7	Ci.-S.	Cu.	NNE	
18.	61.60	27.9	32.1	23.9	66.8	18.3	NNE	3.5	5.5	Ci.-S.	Cu.		
19.	61.97	26.8	32.6	21.3	75.3	19.5	SSE	2.7	1.8	Ci.-S.	S.-Cu.		
20.	62.05	27.4	33.5	22.1	79	21.1	SSE	3	4.5	Ci.-S.	Cu.	S	
21.	61.44	27.2	33	22.1	76	20	SSE, NNE	3	4.8	Ci.-S.	Cu.	NNE	
22.	60.75	27.1	31.9	22.6	77.8	20.5	SSE, NNE	2.5	1	Ci.-S.	S.-Cu.		
23.	61.91	26.4	31.6	20.6	75.7	19	S, NNE	2.8	3.3	Ci.-S.	S.-Cu.		
24.	61.99	26.8	32.4	22.9	65.8	16.9	SSE	3.8	3.7		Cu., S.-Cu.		
25.	61.80	26	30.1	21.5	67.7	16.6	SE	3.7	2.2	Ci.-S.	S.-Cu.		
26.	59.96	26.4	31.4	21.9	66.8	16.6	SSE, NNE	3.5	2	Ci.-S., A.-S.	S.-Cu., Cu.		
27.	58.29	27.2	32	23.2	74.5	19.8	NNE	2.2	8.8		Cu.	NNE	
28.	58.84	26.6	32	22.5	75.5	19.2	SSE	2.2	9.2	Ci.-S.	S.-Cu.		
29.	59.59	26.9	32.7	21	75.5	19.6	Variable	3	3.8	Ci.-S.	Fr.-Cu.	NNE	
30.	59.91	26.8	31.7	23.8	80.7	21	NNE	2.8	4.3		Cu.		
Mean	760.57	27.1	32.3	22.5	74.8	19.6		2.9	6.1				
Total												4.8	

## BAGUIO.\*

[ $\phi=16^{\circ} 25' N$ ;  $\lambda=120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied,  $-1.65$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	637.98	18.6	24.4	16.4	70.3	11.1	E quad.	532.4	6.7	Ci., A.-Cu.	Cu.		☉° p.
2.	37.98	18.4	24.8	15.8	76	11.8	SE, E	386.3	7	A.-Cu.	Cu.	11.7	☉° p.
3.	38.16	18.1	24.8	15.4	86.3	13.2	Variable	279.1	6.4	Ci.	Cu.	3	☉° p.
4.	38.24	18.8	24.8	15.3	77.7	12.3	E quad.	372.3	4.7	Ci.-S., A.-Cu.	Cu.		☉° p.
5.	38.42	18.7	24.7	15.8	84	13.3	E	380.7	6.6	Ci.	Cu.-N.	30	☉° p.
6.	38.30	19	23.2	16.5	82.2	13.4	E	320.7	6.4	Ci.-S.	Cu.-N.		☉° p.
7.	38.68	19.4	25.8	16.3	69.3	11.6	Variable	443.4	2.9	Ci.	Cu.		☉° p.
8.	38.68	19.8	26.2	16	62	10.6	SE, E	498.3	1.6	Ci.	Cu.		☉° p.
9.	38.53	18.6	24.8	15.5	68.3	10.6	SE	325.6	2.6	Ci.-S.	Cu.		☉° p.
10.	37.92	18.6	23.9	15.7	69.5	11.1	E quad.	288.6	5.1	Ci.	Cu.		☉° p.
11.	37.95	18.7	24.9	14.7	77.7	12.4	Variable	227.1	4.6	Ci.	Cu.		☉° p.
12.	38.24	18	24.3	14.8	83.5	12.8	Variable	330	3	Ci.	Cu.		☉° p.
13.	38.19	17.3	21.7	14.6	87.8	12.9	W quad.	225.9	7.7	Ci.	Cu.-N.		☉° p.
14.	37.76	16.2	22.3	12.9	84.5	11.4	Variable	231	5.7	Ci.	Cu.		☉° p.
15.	38.20	15.6	22.5	12.3	76.7	10.2	W quad.	234.4	5.9	Ci.	Cu.		☉° p.
16.	38.45	16.1	20.3	13.6	88.7	12.1	SW quad.	201.4	6.4	Ci.	Cu.		☉° p.
17.	38.01	16.8	22.5	13.3	94.2	13.4	SW	163	6.3	Ci.	Cu.		☉° p.
18.	38.77	17.2	22.3	14.3	92	13.4	W quad.	233.3	8.7	Ci.	Cu.-N.		☉° p.
19.	39.31	17.8	25	13.5	83	12.4	E	327.7	2.7	Ci.	Cu.		☉° p.
20.	39.70	17.8	24	14.9	82.3	12.5	E quad.	414	6.1	A.-Cu.	S.-Cu.	15.2	☉° p.
21.	39.08	17.6	23.7	14.7	80.2	12	Variable	432.9	4.3	Ci.	Cu.		☉° p.
22.	38.38	18	25	13.5	78.7	11.8	E quad.	420.1	4.1	Ci.	Cu.		☉° p.
23.	39.23	17.2	24.4	13.8	84.7	12.2	E	298.2	4.7	Ci.	Cu.		☉° p.
24.	39.16	16.4	23	12.5	74.7	10.4	E	236.9	4.6	Ci.	Cu.-N.		☉° p.
25.	38.70	15.5	21.3	12	80.3	10.4	E, WSW	446.7	5.7	Ci.	Cu.		☉° p.
26.	37.17	16.2	22.3	12.3	80.7	10.8	Variable	553.8	8.7	A.-Cu.	S.-Cu.		☉° p.
27.	36.23	17.4	23.8	13.7	74.8	10.9	E quad.	291.6	4.6	Ci.	Cu.		☉° p.
28.	36.89	17.1	21.5	15.2	79.8	11.6	E quad.	229.7	3.7	Ci.	Cu.		☉° p.
29.	37.32	17.2	24.3	14.3	86.3	12.7	SW quad.						☉° p.
30.	37.70	17.5	23.1	14.3	86.5	12.9	Variable						☉° p.
Mean	638.24	17.7	23.7	14.5	80.1	11.9		333	5.1				
Total												60.7	

\* The barometric readings of this station are not reduced to sea level.

*Meteorological data for first and second class stations—Continued.*

**VIGAN.**

[ $\phi=17^{\circ} 34' N$ ;  $\lambda=120^{\circ} 23' E$ ; barometer above sea, 12.2 meters; gravity correction not applied,  $-1.61$  mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	759.82	27	32.4	24	86.8	22.7	Variable	136.8	5.7	A.-Cu.	Cu.	NNE		☐ 3° d° p.
2.	60.13	27.1	31	23.9	85	22.6	NW	151.3	6.3	A.-Cu.	Cu.	NW		d° p.
3.	60.18	27.5	31.7	23.7	87.7	23.5	NW quad.	110.8	3.8	Cl., Cl.-S.	Cu.	WNW		☐ 3° p.
4.	60.11	27.8	31.7	24.3	87.7	24.3	ESE, NW	136.1	2.8	Cl.	Cu.	NNW		☐ p.
5.	60.32	27.2	31.2	24.1	91.3	24.4	NW	137.4	5	Cl., Cl.-S.	Cu.	NW	1.6	☐ a. ° 3° d° p.
6.	60.18	27	32.3	23.9	91.2	24	NW, SW	85.3	4.5	Cl.-S., A.-Cu.	Cu.-N.	NE		☐ a. d° a. p.
7.	60.37	27.4	31.7	23.7	89.7	24.2	NW	147.2	1	Cl.-S.	Cu.	N		
8.	60.60	28.1	32.8	24.3	89	25	W quad.	101.7	1.7	Cl.	Cu.-N.	SW		
9.	60.48	27.4	33.1	22.7	86.3	23.3	NNE, WNW	117.9	2.7	Cl.-S., A.-Cu.	Cu.	W		
10.	59.79	27.7	34.7	23.3	76.2	20.6	NE, WNW	139.4	1.7	A.-Cu.	Cu.	ESE		
11.	60.15	27.3	32.5	23.2	72.8	19.5	NW quad.	129.8	.2	Cl.	Cu.	N		
12.	60.53	27.2	31.7	23.3	81.3	21.5	NW quad.	137.1	2.2	A.-Cu.	Cu.	ESE		
13.	60.65	27.5	31.6	24	78.5	21.4	NW, NNW	170.1	3.3	Cl.	Cu.	NW		☐ p.
14.	60.70	27.1	32.4	23.5	56.3	14.8	NE	282.3	.8	Cl.	Cu.	N		
15.	61.39	26.2	33.2	21.9	74	18.6	N quad.	198.9	3.3	Cl.	Cu.	NE		
16.	61.60	25	29.8	20.9	81.3	18.9	NNW	210	3.5	Cl.	Cu.	E		
17.	60.96	24.8	29.8	20.1	82.3	18.8	N	235.4	.2	Cl.	Fr.-Cu.	N	☐ a.	
18.	61.83	25.2	30.7	19.9	80.8	19	NW, WNW	101.1	0		Fr.-Cu.	N	☐ a.	
19.	61.91	26.8	31.7	21.8	82.5	21.4	NW quad.	152	0		Fr.-Cu.	N		
20.	62.04	27.4	31.9	22.9	83.5	22.4	NW, W	101.3	1	Cl.-S.	Cu.	N		☐ p.
21.	61.25	26.8	31.7	23.5	85.5	22.2	NNW	311.9	.5	Cl.-S.	Fr.-Cu.	NNE		
22.	60.82	26.9	30.9	22.3	77	20.1	N quad.	315.7	0		Fr.-Cu.	N		
23.	61.84	28.1	33.1	23	65.3	18.5	N quad.	230.6	0		Fr.-Cu.	NE		
24.	62.14	27.7	32.5	24.5	55.7	15.4	NE	381.6	0		Fr.-Cu.	NE		
25.	61.85	26.9	32	24.1	62.7	16.5	N quad.	279.3	.7		Fr.-Cu.	NE		
26.	60.03	25.8	31.5	22.1	76	18.6	NNE	148.8	.5		Cu.	NW		
27.	58.24	26.2	32.5	21.2	86.5	21.8	SW	115.7	4	Cl.-S.	Cu.	ENE		
28.	59.12	26.7	29.9	23.8	87.8	22.8	Variable	90.4	9.2	A.-Cu.	Cu.-N.	NE		d° a. p.
29.	59.54	26.5	31	23.2	86.5	22.2	Variable	121.8	1.7	A.-Cu.	Cu.	NW		
30.	59.92	25.5	29.5	22.1	87.8	21.1	NNW	379	.3		Cu.	NNW		
Mean	760.62	26.9	31.8	23	80.5	21		178.6	2.2					
Total								5,356.7					1.6	

**TUGUEGARAO.**

[ $\phi=17^{\circ} 36' N$ ;  $\lambda=121^{\circ} 40' E$ ; barometer above sea, 23 meters; gravity correction not applied,  $-1.61$  mm.]

[illegible]

**APARRI.**

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.					mm.	
1.	761.44	25.3	30	22.6	83.5	19.9	S	218.5	9.2	Cl.-S.	S	S.-Cu.	S		☉ a.
2.	61.25	25.2	29	21.6	84.3	20.1	E quad.	215.3	8	A.-Cu.	S	S.-Cu.			
3.	61.42	26.1	30.5	23.5	88	22	E quad.	233.4	.7			S.-Cu., Cu.-N.		☉ a.	
4.	61.84	26	30.4	22.6	86.2	21.3	E quad.	155.4	5.8			S.-Cu., Cu.-N. SE	2.5	☉ a. ● p.	
5.	62.02	25.9	29.5	22.6	85.2	21.1	ENE	323.1	2	A.-Cu.	E	S.-Cu.		☉ a.	
6.	61.77	26.1	30	23.9	86	21.6	E, SE		6.7			Cu.-N.	E	☉ a.	
7.	62.20	26.2	30.9	23.1	85.3	21.5	ENE		3.8	A.-Cu.		S.-Cu.	SE	☉ a. ● p.	
8.	62.65	26.6	30.5	23.4	84.5	21.7	E quad.	218.3	1.7			Cu.-N.	E	☉ a. ☉ a. p.	
9.	62.08	25.7	31	21.1	84.3	20.6	Variable	310.6	.2	A.-Cu.				☉ a.	
10.	62.15	26.6	30	22.5	77	19.8	ENE	366.8	2.3	A.-Cu.	E	Cu.-N.	E	☉ a.	
11.	61.67	25.5	29.8	22.1	83.7	19.6	Variable	221.1	0					☉ a.	
12.	62.42	24.9	28	22.6	83.8	19.5	E	273.4	9	A.-Cu.	E	S.-Cu.	E, NE		
13.	62.46	25.2	28.8	21.5	75.8	17.9	NE quad.	293.1	7.3	Cl.		S.-Cu.		☉ a. ☉ p.	
14.	63.10	24.4	28.5	20.1	73.3	16.5	Variable	293.6	3.8	A.-Cu.	E	Cu.-N.	ENE	8.6	☉ a.
15.	63.69	24.1	28.1	20.6	82.5	18.3	NE	414.1	8.7	A.-Cu.	E	S.-Cu.	NE	8.4	☉ a. ● a. p.
16.	63.46	23.9	27	22.1	77.8	17.1	NE	377.7	6	A.-Cu.	E	Cu.-N.	NE	1	☉ a. p.
17.	62.31	23.7	26.7	20.1	78.5	16.9	SW	230.3	5.3	A.-Cu.	N	S.-Cu.			
18.	63.46	24	28.6	20	80.8	17.9	SW, NE	176.8	6.3			S.-Cu.	NE	11	☉ ● p.
19.	64.43	25.4	28.9	22.4	79.8	19.2	NE		9.8	A.-Cu.		S.-Cu.	NE, E	1.9	☉ a. ● ● p.
20.	64.18	25.5	28.6	23	85.2	20.7	NE quad.	283.4	7.5			Cu.-N.	NE, E	1.5	☉ a. ● ● a. p.
21.	63.55	24.2	26.6	21.6	89.2	20	NE	366.5	7			Cu.-N., S.-Cu. E, NE		10.2	☉ a. ● a. ● p.
22.	64.06	24.8	27	23.1	78	18.2	NE	694.8	9.8	Cl.-S.		Cu.-N., S.-Cu. NE		.3	☉ ● a.
23.	64.79	25.1	27.8	23.5	73.3	17.3	ENE	555.1	6	A.-Cu.	E	S.-Cu.	ENE		
24.	65.50	24.6	27.8	22	71.8	16.4	NE	564.9	6.3	A.-Cu.	E	Cu., N. E, NE		4.3	☉ p.
25.	64.58	23.2	26.3	20.1	84.5	17.7	NE	438.7	9.8			Cu., N. E quad.		5.1	☉ a. ● a. p.
26.	62.21	24.2	28.4	20.6	80.3	17.9	NE		9.8	A.-Cu.	ESE	S.-Cu.	ENE	14.7	☉ a. p.
27.	60.18	24.4	27.6	22.7	91	20.6	Variable	234.2	10			Cu.-N.	ENE	16.8	☉ a. ● a. p.
28.	60.90	24.1	26.5	22.4	91.5	20.4	NE	164.9	9.5			S.-Cu., N. E, NE		3.3	☉ a. ● ● p.
29.	60.82	24.6	27.8	22.1	86.5	19.9	Variable	225.7	5.3	A.-Cu.	SE	S.-Cu.			☉ a.
30.	61.93	25	28.1	22.6	81.8	19.2	NE	347.3	6.3			S.-Cu., Cu.-N. NE		.5	☉ ● p.
Mean	762.62	25	28.6	22	82.4	19.4	-----	315.3	6.1	-----	-----	-----	-----	-----	-----
Total	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	94.9

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, NOVEMBER, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan	16		17.3	6.6	55.1	2	14.7	2.6	29.7	1.5	6.6	1.8	26.1			
Zamboanga				1.5		6.1			.8			1.3				
Davao	3.8	13.5	24.1	2.5	3.8				2.5						22.9	
Cotabato	2.8	2.8		.8	3	12.7	26.2			5.1	.3	1.8				
Butuan	8.9	13.2	1.8		.5	13.5	.3	18.8	57.9	3.3	1		2		3.1	4.3
Dumaguete		1		16.3	5.9			13.5	.5	2.5		1				
Yap, W. Carolines	1.6	1		.5	.3	3.5	2.1	.5								9.4
Maasin				6.9	10.2	30.7	7.4	69.6								
San José, Buenavista	2.5	.3			6.6	4.9		28.2							4.1	
Cuyo								1.5								
Guiuan	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	4.8			2	3.3	.9
Borongan	23.9	5.4	8.1	37.1	50.6	34.8	13.8	7.3			17.2		8.7	3	16	60.4
Masbate				.5	19.6		5.9	1.6								
Romblon	.8		4.3	20.8	9.7	2.3	13.2	9.1	.3	6.4	4.8	3	.6			
Batag	22.3	4.6		35.6	7.9	15.7	42.7	12.7		3	5.3	1.3		8.9	26.7	22.4
Gubat			4.1	17.3	23.4	7.6	6.4	5.1	9.9	5.1	19.3			4.3		
Sumay, Guam	1.3	4.5	1.3	.6	.6	10.1	.6		136.5	179.1	9.5	.6			10.8	8.9
Calapan	2	17.3	5.4	.3	.8	9.7	1	31.2		1	.3	.3	2.5		4.3	4.1
Virac	1.3	10.9	9.9	47.3	19.8	4.8	4.9	11.2	11.4	5.3	15.5			1.3		
Nueva Caceres			2.1	15.4		3.3	.8	7.6	27.7					3.7		.6
Batangas				1.3		2.5	.5	15		10.2	1.8				.8	3
Silang					2.8		4.6	6.8	6.1						2.3	
Santa Cruz, Laguna	1.3	2.3	5.6	22.4	6.6	.3	.8	1.5	11.4	4.1	.6	.8	.3		1.8	.6
Antipolo		1		2.8		2.8		2.3	1.5							
Iba																
Tarlac	3.6				5.8											
Baler	32	.8	2.8	15	80.6	1.8	1.8			2.8		.8			1.5	
San Fernando, Union					.8											
Echagüe	2.1		1.1	2.3	9.4	4.1									7.9	
Candon	4.8				1.8											
Laoag		22.4														
Santo Domingo, Batanes	28.4	20.3	9.4	60.6				1		8.9	.5			41.1	6.8	.2

Station.	Day of month.															Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.		
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Isabela, Basilan			1			5.3		15.7				2			111.2	
Zamboanga						1.5	1	26.7							118.7	
Davao															38.9	
Cotabato			1.5		6.9		6.6			13.7	18.5	1.8	53.3	46.7	207.1	
Butuan					7.4										70.5	
Dumaguete			8.9		13.2					.3					158.1	
Yap, W. Carolines				2.3	2.3										64.6	
Maasin															30.8	
San José, Buenavista								.8			.5	2.5	2.5		135.2	
Cuyo															47.4	
Guiuan	15.7	5.9	1	.5	2	.8	1.3	.8	.5						1.5	
Borongan	18	4.4	1	21.1	5.3	2.5	.6	7.4	4.1	3.9		.3	54.6	.5	641.5	
Masbate		8.9	.8	5.8	1.8	1.8	2.5	2.3	.3		4.4		2.5		410	
Romblon	1.5		3.8			1.5	4.6	.6	1.3	.5			.8	9.4	58.7	
Batag	1.8	34.3	15.5	13.2	3.8	4	2.5	3	3	72.4	1.3	42.2	43.2		99.3	
Gubat		9.1			21.1	7.9	27.2	4.8		2.5			5.1	13.7	449.3	
Sumay, Guam	5.1		1.9		.6	.6			2.4				2.5		377.5	
Calapan	1.5	1.8	31.5	7	9.6	5.1	10.2	.5	.5		.8	.8	.8	3.8	154.1	
Virac		5.8	16	.5	18.6	38.4	54.1	.5	74.2	2.8	1.5	76.4	3.9		436.3	
Nueva Caceres		.5	1.3		15	94	115.6	1.5	.9	40.6	.8	.5		.4	339.5	
Batangas			6.8	.3	1.3						1		3	.8	48.3	
Silang			2.8	5.1	1.8	2.5				3.3	4.8				42.9	
Santa Cruz, Laguna	.8	1	9.9	1.6	2.9	5.1	.8	.3			13.9		1.6		101	
Antipolo				3.8		1					6.3				21.5	
Iba				2.4											2.4	
Tarlac														.5	9.9	
Baler				1.8							62.5	11.2	2.5		217.9	
San Fernando, Union															.8	
Echagüe			22.6	4.6		6.6			2.8	2.8	5.4	16.6		3.3	91.6	
Candon												12.7			19.3	
Laoag												.3			22.7	
Santo Domingo, Batanes	.3	2.3		1.1				7.9	3	7.1	13.2	18.3	43.7	5.9	280	

\* No observation.

b 20 days of observation.

## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, NOVEMBER, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Dapitan.		Butuan.		Dumaguete.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30.9	20.7	31.8	21.6	31.1	22.1	31.3	22	33.5	21.6	30.8	22.5	30.3?	22.2	30.2	23
2	30.8	21.2	31.4	21.1	30.8	23	31.7	21.5	33.6	21.8	31.4	23.3	29.2	23.2	30	24
3	31.9	21.3	30.3	21.6	29.9	23.5	31.7	22.1	33.4	22.2	31.7	22.1	29.6	23.1	30.3	24.3
4	30.9	20.4	31.6	21.4	29.1	23.1	30.8	21.6	34.9	22.3	29.5	22.5	28.2	23.5	31	24.2
5	31.8	21.8	32	22.1	30.6	22.9	31.2	22.4	34	22.6	31.3	22.3	28.5	22.6	29.5	24.4
6	32.2	21.9	31.8	22.8	30.5	23.1	31.7	22	34.5	23.2	31.2	21.7	28.3	23.6	29.9	23.7
7	30.9	21.7	31.6	22.3	30.5	22.3	32.2	21.7	34.1	22	30.4	22	28.5	23.2	30.3	24.6
8	30.9	21.6	33	22.1	30.7	23.5	30.2	22	33.1	22.5	30.5	25.7	27.2	23.6	31.1	24.3
9	30.4	22.6	32.1	23.3	31	23	28.7	22.9	30.5	22.5	27.1	24.3	25.7	22.6	29.7	24.3
10	30.9	22.8	32.1	21.7	31.6	23.7	30.2	22.8	32.3	21	30.9	24.8	28.3	22.1	30.5	24.2
11	29.2	21.7	32.6	21.7	32.1	23.4	32.7	22.5	34.1	22.1	31.7	24.1	28.5	22	30.6	23.3
12	30	21.9	32.8	22.1	29.5	23	32.7	21.5	33.9	22.8	30.7	23.8	28.6	21.4	29.7	23.6
13	30.6	20.3	32.8	22.5	31.4	23.4	31.2	21	33.7	21.8	30.9	22.8	28	21.8	30.5	22.5
14	31.3	22.8	33.1	21.7	30	21.9	30.3	21.2	32.6	22.5	30.4	22.6	27.5	21.1	30.4	22.7
15	31.2	22.9	32.1	18.5	30.1	20.4	32.3	20.5	33	21.6	31.4	21.1	28.1	21.6	30.2	21.8
16	31.2	21.1	31.1	20.1	30.2	21.4	30.5	21.5	33.8	21.3			28.2	19.6	30.2	21.8
17	31.4	20.8	32.6	23.1	31	21.1	31.2	20.3	34.2	20.2			28.5	20.6	29.8	22.8
18	30.5	20.8	31.3?	20.5	30.5	21.4	31.2	21.1	33.9	21			28.6	22.5	30.3	22.8
19	31	21.6	32.6	21.3	31.6	22.1	31.3?	22.5	36	21.8			29.4	22.6	30.7	24.2
20	32	21.6	31.1	21.3	30	23.2	32.9	22	34.1	22.1			29.1	22	30.7	23.2
21	31.4	21.7	33.3	21.6	31.6	22.5	31.7	21.5	34.8	22.6			28.3	22.9	30.5	24.3
22	31.8	22.1	33.6	21.1	29.2	23.4	31.7	21.8	35	21.3			27.1	22.2	31.2	23.5
23	28.7	21.7	33.2	23.1	30	23	30.8	21.5	33.7	21.2			29.3	23.2	30.3	22.8
24	28.3	21.7	29	22.1	28.9	23	32.7	21.2	33.9	21.7			29.1	22.2	31.6	23.4
25	30.2	21.1	32	21.1	30.4	21	33.2	20.4	34.5	21.2			26.8	20.3	29.8	22.7
26	29.3	22.8	33.1	22.6	30.5	22	31.8	21.6	33.2	20.8			27.6	21.8	30	22.7
27	29	21.6	31.1	20.8	29.1	21.8	30.7	22	34.2	21.2			29.5	20.9	30.3	22
28	29.8	21.3	31.1	20.9	30.4	22.3	30.7	22.8	35.7	22			29.1	21.5	30.2	22.4
29	30.8	21	31.4	21.1	30	22.5	31.2	22.4	35.1	22.7			28.8	21.2	30.4	22.2
30	30.9	21.8	31.2	22.1	29.5	21.5	30.7	22.5	35	21.8			29.6	22.4	30.7	23.2
Mean	30.7	21.6	32	21.6	30.4	22.5	31.4	21.7	33.9	21.8			28.4	22.1	30.4	23.3

Day.	Yap, Western Carolines.		Maasin.		San José Buenavista.		Cuyo.		Guiuan.		Borongan.		Masbate.		Romblon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	32.4	23.5	31.2	23.4	23	23	28.7	21.9			30.6	20.5	31.6	24.4?	32	23.5
2	32.2	24.8	31.1	23.3		22.4	30.3	25.8			31.3	22	33	25.6	32.9	24.9
3	32.7	24.5	31.2	23.4		22.6	31.5	25.9			31.2	21	32.5	25.2?	32.3	24.4
4	33.5	25.2	30.5	23.5		22.6	30.6	26.6			30.5	22.7	30.6	25.6	32.2	23.9
5	32.9	24.4	30.5	24		23.3	30.7	25.2			29.6	22.4	30.5	22.5	31.6	23.4
6	32	25.5	29.5	23.2		23	30.7	26.4			31	23.1	32.5	24.6	33.2	23.8
7	32.7	25.2	30.4	23.2		23.5	31	26.1			28.2	21.5	31	25.8	32.2	25.4
8	32.2	24.7	30	23		23	30.6	25.9			31	22.4	29.2	26	31.7	24.9
9	33.3	25.7	30.2	22.7		23.5	30.2	25.5			31.2	20.2?	32.4		31.5	24.8
10	31.4	25.5	31	22.8		22	30.3	26.1			31.2	23	31.8	26.2	32.8	24.5
11	32.6	25.3	31	22.6		20.5	30	25.8	30.5	25.4	30.5	21.5	31.2	25.6	31.1	23.1
12	32.9	25.6	30.4	22.7		21.7	30.1	25.1	30.9	24.2	30.9	22	32	25.5?	31.7	23.1
13	31.2	24.6	30.5	23.6		21	29.6	25.9	31	24.9	30.2	20.4	30.5	25.5	31.7	23.3
14	32.7	24.1	30.5	20.8		21.1	29	25	29.9	22.5	29.6	18.5	30.5	24.6	31.6	20.5?
15	33.3	25	31	20.6		19.4	29.3	24.9	30.6	22.6	30.8	22.6	29.5	23.6	31.8	23.7
16	34	24.7	30	20.8		21.3	29.4	25.3	27.4	24	29.7	21.2	29.5		32.6	22
17	32.7	24	29.6	20.6		21.6	29.1	25.5	29.3	23.1	29.6	21.1	29.5	25.2	31.7	23.7
18	33.6	25	29.8	20.6		21.7	30.1	25.7	28.8	23.8	30.4	23	30.2	25.2	31.5	22.2
19	32.3	24.7	30.8	20.7		22.2	29.9	26.1	30.8	22.6	30.5	20.7	29.6	25.2	31.5	24.2
20	33.7	25.5	30	20.7		22	30.6	26	30.3	24.3	30.8	21.4	31.6	24.8	32.4	24.6
21	32.8	24.9	30.4	23.4?		21.6	30	25.6	30.6	25.1	30.5	21.4	31.4	24.8	32.5	24.2
22	32.7	23.6	31.5	22.6		20.4	29.6	26	30.4	24.3	31	20.3?	31.8	25.6	30.8	24.8
23	33.7	24.5	31.3	21.6		20.4	29.6	25.7	31.2	24.6	30.8	21.2	31.8		30	22.7
24	33.5	24.5	31.4	21.4		19.8	28.7	25.6	30.7	25.9	30.1	21.2	27.4	24.4	31.3	23
25	33.2	24.4	31	21.6		20.5	28.8	25.4	30.5	24.3	30.3	20.4	27.5	24.6	31.7	23.2
26	33.2	24.3	31	21.5		20.4	29	25.1	31.2	24.9	30.8	21.5	28.6	24.8	31.2	22.7
27	32.2	24.1	31.1	21.8		20.6	31.2	23.2	30.9	25	30.2	20.5	28.8	25.2	30.3	23.5
28		24.6	30.8	21.2		21.4	29.9	22.1	31.5	21.9	31	20	31.6	24.5	31.2	21.8?
29	32.7	24.9	31	22		20.6	30	25.4	31.8	25	30.5	19.4?	31.5	25.2	31.1	22.8
30	33.5	24.7	31	21.6		22.1	30.2	25.5	31.3	24.4	29.6	20	31.5		29.7	23.8
Mean	32.8	24.7	30.7	22.2		21.6	30	25.3	30.5	23.9	30.5	21.2	30.7	25	31.7	23.5

Maximum and minimum temperatures for third-class and rain stations, November, 1913—Continued.

Day.	Batag.		Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	28.5	21.6	30.2	23	30.1	24.8	30	22.5	29.4	21.6	28.6	21	32.4	23.8	29.1	20.6
2	29.8	21.9	31.5	23.4	29.5	25.7	30.3	23	31.2	21.8	32	20.5	33.7	23.3	28.5	20.3
3	30	23	32	23.2	28.7	24.3	30.6	23	31.6	21.5	32.4	21.7	33.8	23	29.3	20.8
4	30.1	23.1	29.7	24.9	29.9	25.8	30.5	23	28	22.3	31.1	21.1	31	22.6	30.8	19.6
5	27.1	22.3	26.2	23.5	29.7	26.5	30.5	23.3	28.3	22.1	30.3	21	33.3	23.2	29.2	19.1
6	30.1	23.4	32.5	23.6	29	25.7	31.2	24	31	21.5	33.1	21.4	34	23.5	28.5	19
7	29	22.4	31.3	24.1	30.1	25.8	30.5	25.1	32.2	23.3	31.2	22.4	34.1	23.9	28.8	19.3
8	29	23	30.3	25.5	29.6	26.4	28	24	30	23.1	31.7	22.5	30.9	24.4	28.7	19.5
9	30.3	23	32.2	26.3	29.2	26.6	31	24	30.8	22.8	30.8	21.2	32.3	22.8	28	19.9
10	30	23.5	32.4	24.7	26.7	24.1	30.1	25	32.5	21.6	31.6	21.7	31	23.2	29.2	19.5
11	30	22.1	31	23.6	28.1	24	29	22.3	31.8	21.7	31.3	19.9	30.2	21.5	28.5	19.2
12	30	23.5	31.7	23.5	29.5	26.4	31	22.5	31.6	21	31.4	18.2	33	21.4	28.8	20
13	29.4	22.6	29.9	23.9	28.9	26.5	30	22.6	30.6	20.9	30.6	21	30.7	21.6	29.9	19
14	29	22.5	30.4	20.9	30.5	23.1	29.5	19.5	29.5	18.6	30.5	18.5	31.9	18.8	30.2	18.7
15	29.9	20.9	31.4	22.1	30.2	25.9	30.6	20.5	30.4	21.5	30.1	21.2	31	18.1	30.6	18.3
16	28.4	21.4	30.9	23.4	31	23.8	30.1	21.5	31	21.27	30.6	21.5	30.9	21.2	30.8	18.8
17	30	21.3	31.4	21.4	29.9	24.4	30	21.4	31	21.1	30.3	20.8	31.2	21.5	28.7	19.2
18	29	22.5	23	29.2	23.7	29.6	21.4	30.4	21.9	30.2	21	32.5	19.5	28.4	19.6	19.6
19	28.4	22.6	24.4	28.8	25.3	28	22.8	30	23.3	28.2	22.8	32.4	20.9	29	19.4	19.4
20	30.4	22.3	24.7	28.5	24.3	31.5	22.9	32.8	22.9	31.2	20.6	31.2	22.6	27.9	19	19
21	30	22.4	24	29.5	24	28	22	28.5	21.3	30.9	19.5	31	22.4	27.6	18.7	18.7
22	29.8	22.9	24	29.4	24.5	27.2	22.7	31.1	22.6	31.6	20.4	29	21.2	27.5	19.2	19.2
23	30	23.1	24.3	29.9	22.9	27.5	23	25.5	22	26.5	21.6	30	22.2	28.1	18.8	18.8
24	27.6	22	23.4	29.5	23.4	29.5	23.9	28.6	21.7	27.5	20.3	31.1	21.3	28.8	19.6	19.6
25	29.9	22.5	22.8	29.2	25.2	30	22	29	20.2	28	20	31.3	18.3	29.4	19.4	19.4
26	28.9	22.1	23	29.3	24.2	30.5	21.5	28.3	23.1	29.1	21	32.7	19.4	29.6	19.2	19.2
27	28.6	21.6	24	29.2	25.5	27.5	22.1	30.3	23.5	27.3	21.9	27.7	22.4	28.2	19.5	19.5
28	29.6	22.1	23.7	29.4	25.4	29.8	21.1	31.1	21.5	30.7	21	32.5	21.8	28	19.8	19.8
29	29.9	22	23.1	29	24.9	30.1	22.5	29.8	22	31.2	20.9	30.3	21.1	29.3	19.6	19.6
30	29	21.9	24.1	29.4	24.9	30.5	23.6	27.6	22.4	28.2	22.4	31.8	22.6	29.8	20	20
Mean	29.4	22.4	30.9	23.6	29.4	24.9	29.8	22.6	30.1	21.9	30.3	21	31.6	21.8	29	19.4

Day.	Sta. Cruz, Laguna.		Antipolo.		Iba.		Tarlac.		Baler.		San Fernando, Union.		Echague.		Candon.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	28.5	24	29.7	21.7	30.4	22.8	26.5	22.2	32.5	22.4	34.2	23.2	27.1	21.4	31.2	24.5
2	32.9	23	31.4	20.6	32.9	22.4	32.2	21.4	30.4	20.6	32.5	23.6	31.3	20.2	29.2	23.2
3	31.5	29.4	32	21.9	34.1	21	33	21.5	32.6	23.1	32.7	21.9	31.7	21.8	30.4	23.9
4	27.3	23.6	27	21.6	34	21.9	28.2	21.6	28.7	23.7	34.3	22.1	26.4	22.6	31.3	23.8
5	26.9	23.6	28.8	22.2	33.7	22.5	30	22.8	28	23	33.6	22.7	30.3	22.4	30.5	24.7
6	31.6	22.5	30.2	21.3	33	22	31.1	21.7	28.5	23	32.9	22.5	27.8	23.3	29.9	23.6
7	28.6	23.6	31	21.3	34.1	21.5	33	21.8	31.1	22.9	33.1	22.2	32.3	22	31.2	22.9
8	29.5	23.5	30.2	22.8	34.5	23	33.5	21.6	32.8	23.6	33	22.2	30.7	21.7	30.8	23.7
9	30.6	23.5	32.2	21.4	34	20.9	33.4	21.9	32.5	23	32.4	21.8	32.3	21.3	30.7	22.8
10	28.5	23.5	30.7	21.5	33.4	21.5	33.5	22.8	32.8	23.5	34.1	22	30.3?	22.4	31.8	24
11	29.5	22.5	31.1	20.5	33	20.6	33.5	22.6	31.9	22.5	32.6	22.1	31.5	20.8	30.7	22.6
12	31	20.1	32	19.2	32.5	19	33.1	19.8	30.6	21	32.4	21.6	29.7	19.4	30.9	23.2
13	28.8	22.5	29.9	19.4	32.4	20.5	32.5	21	31.4	22	32.4	22.5	29.1	21.8	30.8	23.9
14	28.9	20.1	29.6	19.2	33.4	21.4	29.9	19.7	30	20.2	32.6	21.9	28.7	19	30.7	22.4
15	30.2	21.1	28.2	18.3	33	20.4	32.2	19.3	31	18.2	32.4	18.4	26.3	17.8	29.2	19.5
16	28.7	22.4	29.7	19.7?	31.9	19	32.7	19.7	29.7	20.2	32	19.3	28.4	20.4	30.4	19.6
17	30.1	22.8	30.9	19.7	32	19.5	32.6	20	31.1	19.7	31.7	20.8	27.3	18.2	29.7	21.2
18	30.7	22.6	31	19.9	33	21	31.7	20.2	31.5	20.8	32.6	22.1	29.2	19.9	29.2	22.1
19	27.6	23	31	20.9	32.5	19.5	34	20.1	34.2	22	32.5	20.7	27.8	21.7	29.9	21.2
20	30.3	22.6	28.3	21.9	32.1	21.1	33.6	22	32.3	21.7	32.8	20.7	24.5	22	31.8	22.5
21	28.6	22.7	30.8	20.2	32	19	34.2	20.5	32.8	20.3	32.7	21.8	29.8	20.7	30.5	22.5
22	26.7	22.2	27.8	20.3	32.4	21	33.9	20.5	34.6	20.8	32.1	20.4	26.3	20.7	32.2	22
23	28.9	23.7	30.9	20.3	33	20.4	34	20	31.5	21.8	32.2	21.3	28.2	20.5	31.9	22.7
24	27.6	23.2	29.6	20.6	33	20.5	33.8	20.3	32.3	22.1	32.2	21.4	27.6	20.4	30.9	21.6
25	28.4	21.2	30.4	18.2	32.9	21.9	33.5	20	30.5	20.8	31.6	18.4	27	18.8	30.5	19.8
26	30.1	21.4	31.2	20	32.8	18.5	33.4	20	33	21.6	31.6	18.9	28.4	19.2	29.6	20.6
27	25.7	22.5	24.1	21.1	31.6	20.3	30.5	21.7	27.3	21.8	32.5	21	26.4	21.4	29.6	21.5
28	30.6	22.4	32.1	20.7	32	20.5	32.7	21.3	26.5	21.5	32.5	23.2	26.9	22.2	30.3	24.4
29	29.9	22.1	30.7	20.6	32	20	34.2	20	29.9	20.2	32.5	21.1	29.8	19.7	29.5	21.9
30	29.5	22.1	30.8	21.5	32.4	19.6	34.1	21.4	31	21.5	32.1	20.8	28.4	21.8	30	22.5
Mean	29.3	22.6	30.1	20.6	32.8	20.8	32.5	21	31.1	21.6	32.6	21.4	28.7	20.8	30.5	22.5



Maximum and minimum temperatures for third-class and rain stations, November, 1913—Continued.

Day.	Laoag.		Sto. Domingo, Batanes.		Day.	Laoag.		Sto. Domingo, Batanes.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.		°C.	°C.	°C.	°C.
1.....	33.2	22.3	29.2	21.9	17.....	31.7	19.1	26.8	20.6
2.....	32.2	22.9	29.7	22.3	18.....	33.1	18.2	26.9	19.4
3.....	33.6	22.2	29.7	21.8	19.....	34.7	19.7	26.9	
4.....	32.4	23	29.5		20.....	36.4	20.5	27	20.8
5.....	33.2	22.5	29.8	20	21.....	33.4	20.4	26.9	22
6.....	34.1	22.2	30	21.6	22.....	31.8	23.3	27	20.7
7.....	33.7	23.5	30.4	22.9	23.....	34.2	18.9	27.6	21
8.....	35.8	22.1	29.8	22.3	24.....	33	18.1	27.2	21.4
9.....	34.3	20.1	30.4		25.....	33.2	18	26	20.4
10.....	35.5	21.1	27.9	22.5	26.....	32.7	20.4	26	21.2
11.....	35	18.9	27.9	21.6	27.....	34.2	20.2	28.4	22
12.....	33.7	20.5	28.9	22	28.....	31.2	23	28	22.3
13.....	32.6	21.6	29.2	21.5	29.....	32.1	20.5	26.5	21.5
14.....	32.8	17	27.5		30.....	31.2	23.4	26.1	20.5
15.....	31.1	19.8	25.5						
16.....	31.2	22	25.3		Mean.....	33.2	20.8	27.9	21.4



# SEISMOLOGICAL BULLETIN FOR NOVEMBER, 1913.

By Rev. MIGUEL SADERRA MASÓ, S. J.,  
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## EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

5, 8<sup>h</sup> 25<sup>m</sup> [5, 16<sup>h</sup> 25<sup>m</sup>]. Ormoc (W of Leyte). Oscillatory earthquake direction SW-NE, intensity V, duration 10 seconds.

12, 5<sup>h</sup> 16<sup>m</sup> [12, 13<sup>h</sup> 16<sup>m</sup>]. Butuan (N Mindanao). Oscillatory and subsultory earthquake, direction ENE-WSW, intensity IV, duration 6 seconds. It was followed by slight subterranean noises.

12, 9<sup>h</sup> 54<sup>m</sup> [12, 17<sup>h</sup> 54<sup>m</sup>]. Ormoc (W of Leyte). Oscillatory and subsultory earthquake, direction SSW-NNE, intensity V, duration 15 seconds. At 11<sup>h</sup> 36<sup>m</sup> [19<sup>h</sup> 36<sup>m</sup>] there was a repetition of intensity III.

12, 19<sup>h</sup> 36<sup>m</sup> 43<sup>s</sup> \* [13, 3<sup>h</sup> 36<sup>m</sup> 43<sup>s</sup>]. W of Luzon. Earthquake of intensity V, felt principally along the coast for about 120 kilometers in Ilocos Sur. It originated not far from the coast, probably in the China Sea; it was perceptible for a distance of more than 60 kilometers inland.

13, 7<sup>h</sup> 41<sup>m</sup> 13<sup>s</sup> \* [13, 15<sup>h</sup> 41<sup>m</sup> 13<sup>s</sup>]. N of Luzon. Earthquake of intensity IV, felt throughout nearly all the provinces north of 16° lat. N. Its epicenter was probably in the Mountain Province and comprehended a prolonged zone in the SW-NE direction so that it was felt fairly strongly in both Aparri and Bolinao, which are 300 kilometers apart. On the other hand it appears that the propagation of the seismic waves was very slight in the NW-SE direction for the shock was not perceptible in the Province of Ilocos Norte nor in the southern part of the Cagayan Valley. The origin of this extensive earthquake must be placed in the Subprovinces of Benguet, Lepanto, and Bontoc.

13, 12<sup>h</sup> 57<sup>m</sup> [13, 20<sup>h</sup> 57<sup>m</sup>]. Ormoc (W of Leyte). Oscillatory earthquake, direction SW-NE, intensity III-IV, duration 5 seconds. The origin of this and the preceding earthquakes of Ormoc was in the Bay of the same name, not far from the islets called Camotes, where there is undoubtedly a seismic center of volcanic character, which gives rise to frequent earthquake shocks of varying intensity but with a small radius of action.

13, 19<sup>h</sup> 55<sup>m</sup> [14, 3<sup>h</sup> 55<sup>m</sup>]. Borongan (E of Samar). Earthquake of intensity III.

26, 18<sup>h</sup> 57<sup>m</sup> 00<sup>s</sup> \* [27, 2<sup>h</sup> 57<sup>m</sup> 00<sup>s</sup>]. SE of Samar and NE of Mindanao. Earthquake which very probably originated in the great deep of the Pacific between the NE of Mindanao and the extreme SE of Samar. Owing probably to the lateness of the hour, the shock was reported from the stations of Guiuan and Butuan only, where the intensity was III-IV. It is quite certain however that in the epicenter itself the intensity must have been much greater for the amplitude and duration of the movements registered in Manila and Baguio was great. The epicenter was in the Pacific some 150 kilometers from the above-mentioned stations of Samar and Mindanao; it is very probable that the shock was felt with more intensity in the little islands of Siargao and Dinagat. It was registered by the seismographs in Taihoku, Zikawei, and Osaka.

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observers who sent the report. All time indications are in Greenwich mean time (Midnight=0<sup>h</sup>), insular time being added in brackets for the convenience of Philippine readers.

## RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight = 0h. Instrument: Wiechert seismograph; 1,000 kilograms.  $A_N$ :  $T_0=6.4$ ,  $\epsilon=2.21$ ,  $\frac{r}{T_0^2}=0.081$ ;  $A_E$ :  $T_0=6.5$ ,  $\epsilon=3.79$ ,  $\frac{r}{T_0^2}=0.024$ . Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.	
						A <sub>N</sub> μ	A <sub>E</sub> μ		
353	3	I <sub>v</sub>	eP L M <sub>E</sub> F	<i>h. m. s.</i> 14 51 23 51 41 51 52 55	0.5		51		
354	6	I	e F	10 35 39 47					
355	9	I	e F	3 53 43 4 16					From the Horizontal Pendulums.
356	10	I	eP F	21 22 08 22 02					From the Vicentini.
357	12	I <sub>v</sub>	eP L F	19 36 43 37 20 41					Near the western coast of Luzon.
358	13	II <sub>v</sub>	eP L M <sub>N</sub> M <sub>E</sub> F	7 41 13 41 41 41 48 41 50 51	1 0.5	162	141		Northern Luzon.
359	14	I <sub>d</sub>	eP F	17 58 58 18 02					
360	17	I <sub>v</sub>	eP F	14 18 22 21					
361	18	I <sub>v</sub>	eP L M <sub>N</sub> F	17 43 45 44 10 44 15 49	3	60			
362	19	II <sub>v</sub>	eP S L M <sub>E</sub> F	3 24 26 27 22 30 28 33 52 4 16	12-13		105		
363	23	I	eP L F	23 25 54 26 27 30					
364	26	II <sub>v</sub>	eP S L M <sub>N</sub> M <sub>E</sub> F	18 57 00 58 32 59 35 19 01 27 02 35 55	6-7 6-7	897	115		SE of Samar and NE of Mindanao.
365	30	I <sub>v</sub>	eP L F	18 40 18 40 38 42					

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

5, 8<sup>h</sup> 25<sup>m</sup> [5, 16<sup>h</sup> 25<sup>m</sup>]. Ormoc (W de Leyte). Temblor oscilatorio, dirección SW-NE, intensidad V, duración 10 segundos.

12, 5<sup>h</sup> 16<sup>m</sup> [12, 13<sup>h</sup> 16<sup>m</sup>]. Butuan (N de Mindanao). Temblor de tierra oscilatorio y susultorio, dirección ENE-WSW, intensidad IV, duración 6 segundos. Seguido de ruido subterráneo débil.

12, 9<sup>h</sup> 54<sup>m</sup> [12, 17<sup>h</sup> 54<sup>m</sup>]. Ormoc (W de Leyte). Temblor oscilatorio y susultorio, dirección SSW-NNE, intensidad V, duración 15 segundos. A 11<sup>h</sup> 36<sup>m</sup> [19<sup>h</sup> 36<sup>m</sup>] se experimentó una repetición de intensidad III.

12, 19<sup>h</sup> 36<sup>m</sup> 43<sup>s</sup> \* [13, 3<sup>h</sup> 36<sup>m</sup> 43<sup>s</sup>]. W de Luzón. Temblor de tierra de intensidad V sentido principalmente a lo largo de la costa en una longitud de unos 120 kilómetros comprendida por la Provincia de Ilocos Sur. Su origen se hallaba cerca de las mencionadas costas, probablemente dentro del Mar de la China; en el interior de la isla o sea hacia el E, fué perceptible hasta una distancia de poco más de 60 kilómetros de la costa.

13, 7<sup>h</sup> 41<sup>m</sup> 13<sup>s</sup> \* [13, 15<sup>h</sup> 41<sup>m</sup> 13<sup>s</sup>]. N de Luzón. Temblor de intensidad IV, sentido en casi todas las provincias situadas al norte del paralelo 16° N. Su epicentro se hallaba probablemente en la llamada Provincia Montañosa, y comprendía una zona muy prolongada en la dirección SW-NE, de tal manera que en el expresado rumbo fué bien perceptible en las estaciones de Aparri y Bolinao que distan entre sí más de 300 kilómetros. En cambio parece que las ondas sísmicas se propagaron muy poco en la dirección NW-SE puesto que no parece haber sido perceptible ni en la Provincia de Ilocos Norte ni en la parte sur del valle de Cagayán. El origen de este extenso terremoto debe colocarse en las subprovincias de Benguet, Lepanto y Bontoc.

13, 12<sup>h</sup> 57<sup>m</sup> [13, 20<sup>h</sup> 57<sup>m</sup>]. Ormoc (W de Leyte). Temblor oscilatorio, dirección SW-NE, intensidad III-IV, duración 5 segundos. El origen de éste y de los precedentes temblores sentidos en Ormoc debe colocarse en la bahía del mismo nombre, hacia las islitas llamadas Camotes, donde indudablemente existe un centro sísmico de carácter volcánico, en el que se originan frecuentes temblores de tierra de varia intensidad pero siempre de reducida área de acción.

13, 19<sup>h</sup> 55<sup>m</sup> [14, 3<sup>h</sup> 55<sup>m</sup>]. Borongan (E de Sámar). Temblor de tierra de intensidad III.

26, 18<sup>h</sup> 57<sup>m</sup> 00<sup>s</sup> \* [27, 2<sup>h</sup> 57<sup>m</sup> 00<sup>s</sup>]. SE de Sámar y NE de Mindanao. Temblor de tierra originado sin duda en la fosa del Pacífico entre el NE de Mindanao y el extremo SE de la Isla de Sámar. Debido tal vez a lo intpestivo de la hora, solamente dieron aviso de él las estaciones de Guiuan y Butuan, donde su intensidad fué de III-IV: no hay duda sin embargo que en el epicentro la tuvo mucho mayor a juzgar por la amplitud y duración de los movimientos registrados por los seismógrafos de Manila y de Baguio. El epicentro se hallaba dentro del Pacífico seguramente a unos 150 kilómetros por lo menos distante de las citadas estaciones de Sámar y Mindanao; es probable se sintiese con más intensidad en las pequeñas Islas de Siargao y Dinagat. Registráronlo los seismógrafos de Taihoku, Zikawei y Osaka.

<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.



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## BULLETIN FOR DECEMBER, 1913.

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# METEOROLOGICAL BULLETIN FOR DECEMBER, 1913.

By Rev. JOSÉ CORONAS, S. J.,  
Assistant Director of the Weather Bureau.

## GENERAL WEATHER NOTES.

**Pressure and temperature.**—The mean atmospheric pressure of the month was slightly greater than that of last December throughout the Philippines. In Manila it was 0.83 mm. above normal. The greatest pressures were observed in all stations on the 31st; the lowest, on the 15th in some stations, and on the 24th to 26th in others.

The mean monthly temperature was but slightly different from the normal and from the mean of last December. The extreme temperatures in Manila were 33.2° C on the 12th, and 19.8 C on the 4th.

### PRESSURE AND TEMPERATURE AT THE FIRST AND SECOND CLASS STATIONS FOR DECEMBER, 1913.

Station.	Pressure.						Temperature.					
	Mean.	Departure from December, 1912.	Highest mean.	Day.	Lowest mean.	Day.	Mean.	Departure from Dec., 1912.	Highest.	Day.	Lowest.	Day.
	mm.	mm.	mm.		mm.		°C.	°C.	°C.		°C.	
Tagbilaran	759.75	+0.34	762.31	31	758.10	14	25.6	-0.3	32.8	6, 12	20.4	3, 4
Surigao	59.84	+ .41	62.67	31	58.36	24	25.8	- .1	31.9	26	22.1	2
Cebu	59.94	+ .36	62.64	31	58.50	15	26.7	0	32	23	22.4	4
Iloilo	59.75	+ .43	62.64	31	58.32	15	26.4	+ .3	31	17, 18	22.6	2
Ormoc	60.10	+ .39	62.82	31	58.71	15	26	- .2	32.7	3	20.1	2
Tacloban	60.21	+ .41	63.16	31	58.18	24	25.9	- .1	31.7	18	22	10
Capiz	60.41	+ .31	63.36	31	58.99	25	26.1	- .1	31.4	13	22	10, 11
Calbayog	60.25	+ .48	63.31	31	57.89	25	25.3	0	32.7	12	20.3	4, 6
Legaspi	60.56	+ .31	63.89	31	57.71	25	26.2	+ .5	32	3	22.5	28, 30
Atimonan	61.36	+ .57	65.02	31	59.20	26	25.5	- .1	29.5	11	20.7	3
Ambulong, Tanauan	60.78	- .	63.96	31	59.22	26	25.7	- .	33	26	19.5	2, 3
Paracale	61.42	+ .44	65.05	31	58.74	26	25.7	- .2	30.4	3	20.6	3
Manila	61.32	+ .52	64.48	31	59.54	26	25	+ .2	33.2	12	19.8	4
San Isidro	61.46	+ .40	64.64	31	59.77	26	25.5	+ .8	32.5	14	19	29
Dagupan	60.64	+ .31	63.59	31	59.11	15	26.2	+ .5	34.5	11, 18	19.5	29
Bolinao	60.96	+ .56	63.98	31	59.40	15	26.6	+ .7	33.5	12	19.7	8
Baguio <sup>a</sup>	638.29	+ .58	640.46	31	636.94	27	17.3	- .1	25.5	21	12.4	28
Vigan	761.07	+ .54	764.64	31	759.38	14	25.9	+ .2	33.5	17	18.9	28
Tuguegarao	63.04	+ .70	67.84	31	60.10	26	23.5	+ .3	33.4	22	18.7	31
Aparri	63.26	+ .84	68.94	31	60.33	22	23.4	- .5	29.8	12, 21	18.2	31

<sup>a</sup> The barometric readings of this station are not reduced to sea level.

**Rainfall.**—In general the amount of rain which fell during the month was greater than during December, 1912, but below the normal for the month. The rainfall in Manila was 37.8 mm, which is greater than that of last year by 23.9 mm, but less than the normal by 22.1 mm.

## RAINFALL AT VARIOUS STATIONS OF THE WEATHER BUREAU DURING THE MONTH OF DECEMBER, 1913.

Station.	Total.	Departure from December, 1912.	Departure from normal.	Rainy days.	Departure from December, 1912.	Greatest rainfall in a single day.	Day.	Station.	Total.	Departure from December, 1912.	Departure from normal.	Rainy days.	Departure from December, 1912.	Greatest rainfall in a single day.	Day.
	mm.	mm.	mm.		mm.	mm.			mm.	mm.	mm.		mm.	mm.	
Jolo	156	+ 45.5	- 2.1	16	-1	43.7	15	Calapan	145.3			24		22.4	11
Isabela, Basilan	146.1	+113.1		6	-3	116.1	7	Virac	344.8	+ 56		28	+5	57.4	30
Zamboanga	48.3	- 38.4	- 50.8	8	-4	24.4	19	Nueva Caceres	265.7	+ 66.7	+ 5.7	18	-1	80	17
Davao	230.5	+141.1	+ 21.7	12	+8	51.1	7	Batangas	38	+ 12.7		13	+4	12.9	23
Cotabato	98.9	+ 39.6	- 34.6	10	-1	21.8	5	Atimonan	347.9	+ 86.4	- 24.6	29	+9	86.6	19
Butuan	266	+165.5	- 63.5	24	+6	52.8	28	Ambulong, Tanauan	52.9			12		22.7	19
Dumaguete	56.2	+ 6		14	+1	13.5	24	Silang	47.6	- 37.4		9	-1	10.2	13
Yap, W. Carolines	129.2	- 46.9		20	-5	32.3	15	Paracale	670.7	+178.7		29	+6	103.9	17
Tagbilaran	119.1	+ 78.8	- 46	11	+3	43.5	20	Sta. Cruz, Laguna	129.7	+ 50.7		21	+5	37.6	19
Surigao	777.7	+505.3	+227.2	26	+5	101.6	7	Manila	37.8	+ 23.9	- 22.1	12	+3	12.2	18
Maasin	300.5	+101.5	- 8.5	13	+2	49.3	5	Antipolo	32.4	- 5		13	+5	5.6	17,22
Cebu	88.7	- 18.2	- 66.9	20	+3	22.6	4	Iba	18.2	+ 17.8		4	+3	16.5	13
Iloilo	64.2	+ 26.3	- 57.9	12	+2	23.9	30	San Isidro	3.7	- 28.1	- 43.1	5	-2	1	8
San Jose Buenavista	46.4	+ 30		7	+1	25.9	26	Tarlac	41.4	+ 32.7	- 1.1	3	+2	36.8	4
Cuyo	10.4	+ 10		2	+1	9.4	26	Baler	135.9	-321.9		22	+3	27.2	11
Ormoc	195.8	+130.5	+ 15.1	22	+5	27.7	25	Dagupan	3.3	- 4.6	- 11.7	2	-2	1.8	13
Guiuan	412.5			29		47.8	19	Bolinao	14	+ 11.7	+ 1.3	5	+3	5.8	30
Tacloban	338.8	+112.8		29	+5	38.9	2	Baguio	11.9	+ 5.1	- 42.5	3	0	4.8	23
Capiz	162.3	+112.6	-102.4	21	+6	32.5	19	San Fernando, Union	6.1	+ 4.8	- 3.3	4	+3	2.8	27
Borongan	693.6	+225.8	+ 81.3	31	+9	80.1	19	Echague	103.2	- 20.7		20	+9	17.3	30
Calbayog	241.9	+ 99.7	- 19.9	23	+8	60.4	24	Candon	0	0		0	0	0	0
Masbate	188.7	- 1.8		20	+5	57.7	30	Vigan	3.4	+ 3.4	- 2.4	2	+2	2.3	27
Romblon	222.3	- 3.5		25	+5	51.1	19	Tuguegarao	50	-151.3	-101	15	+2	13.7	17
Batag	388.1			24		44.4	19	Laoag	8.1	+ .6		1	-2	5.8	27
Gubat	461.2	+175.3		26	+5	66.3	29	Aparri	410.3	+100.1	+154.4	21	0	78.3	7
Legaspi	359.3	-215.2	-124.3	25	+6	61.4	30	Sto. Domingo, Bata-							
Sumay, Guam	187.7	- 56.1		19	+6	59.7	14	nes	439.2	+ 43.3		29	+4	53.1	13

## DEPRESSIONS AND TYPHOONS.

The typhoon of December 21-27, 1913.—The only typhoon noted during the month was the one which recurved to the N and NE on the 25th, when the vortex was to the E of Luzon between 13° and 15° Lat. N. The existence of the typhoon was reported on the 24th when it was to the E of Samar, but the observations from Yap and the Pelew which were received later by mail, make it evident that the typhoon was already in existence on the 21st to the S of Yap, and that it passed by the SW of Yap and NE of the Pelew on the 22d moving WNW. On the morning of the 25th, it was announced that the typhoon had inclined to the N and that it would probably recurve to the NE, so that there was no further danger for Luzon. The track of this typhoon was published in the November Bulletin in Plate XV.

## NOTAS GENERALES DEL TIEMPO.

**Presión y temperatura.**—La presión atmosférica media de este mes es para todas las estaciones de Filipinas algo mayor que la de Diciembre del año pasado. La de Manila difiere de la normal en  $+0.83$  mm. Las presiones más altas se observaron en todas partes el 31: las más bajas ocurrieron, salvo unas pocas excepciones, el día 15 en unas estaciones, y del 24 al 26 en otras.

La temperatura media mensual se diferencia muy poco así de la del año pasado como de la normal de Diciembre. Las temperaturas extremas para Manila fueron  $33.2^{\circ}$  C. y  $19.8^{\circ}$  C. registradas los días 12 y 4 respectivamente.

**Precipitación acuosa.**—La lluvia caída este mes en Filipinas resulta para la mayoría de las estaciones mayor que la de Diciembre, 1912, pero menor que la normal de este mes. La cantidad recogida en los pluviómetros de Manila es 37.8 mm. y difiere en  $+23.9$  mm. de la del año pasado, y en  $-22.1$  de la normal.

## DEPRESIONES Y TIFONES.

**Tifón de 21 a 27 de Diciembre, 1913.**—No se ha observado en todo este mes más que un solo tifón el cual recurvó al N y NE el día 25 cuando demoraba el vórtice al E de Luzón entre los paralelos  $13^{\circ}$  y  $15^{\circ}$  N. El Observatorio de Manila anunció la existencia de este tifón al E de Sámar el día 24: pero las observaciones de Yap y Palaos recibidas más tarde por correo no dejan lugar a duda que el tifón existía ya el día 21 al S de Yap y pasó por el SW de Yap y NE de Palaos el 22 moviéndose al WNW. La mañana del 25 pudo ya anunciar el Observatorio que el tifón se había inclinado al N y probablemente recurvaría al NE, cesando así todo peligro para Luzón. Véase la trayectoria de este tifón en la lámina XV publicada en el boletín de Noviembre.

## METEOROLOGICAL DATA FOR MANILA CENTRAL OBSERVATORY.\*

[ $\phi=14^{\circ} 34' 41''$  N;  $\lambda=120^{\circ} 58' 33''$  E; barometer above sea, 14.2 meters; gravity correction not applied, -1.72 mm.]

Day.	Pres- sure (mean).	Air temperature. <sup>b</sup>			Underground temperature.						Relative humid- ity (mean).	Vapor pres- sure (mean).	Evaporation. <sup>b</sup>	
		Mean.	Maxi- mum.	Mini- mum.	0.25 meter.		0.50 meter.		1.50	2.50			Free expo- sure (total).	Shelter (total).
					8 a. m.	2 p. m.	8 a. m.	2 p. m.	metres.	metres.				
									8 a. m.	8 a. m.				
	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	Per ct.	mm.	mm.	mm.
1	760.33	24.9	30.9	20.7	26.9	28	27.7	28	28.4	28.6	79.5	18.6	3.4	2.4
2	60.67	24.8	31	20.7	26.9	28.2	27.8	28	28.3	28.4	81.2	18.7	2.9	2.2
3	61.84	24.6	31	19.9	27.1	28.1	27.9	28.1	28.4	28.4	79.2	18	3.8	2.8
4	62.90	24.3	31.2	19.8	26.9	27.8	27.9	28	28.3	28.2	79.3	17.8	2.7	2.1
5	63.12	24.1	29.4	21.9	27.2	27.6	27.9	27.9	28.4	28.4	83.7	18.7	1.9	1.8
6	62.77	24.5	30.5	20.8	26.8	27.5	27.8	27.8	28.3	28.4	81.3	18.5	2.4	2.1
7	62.08	25	32.6	21	26.8	27.7	27.8	27.8	28.4	28.5	78.5	18.1	3.9	3
8	61.22	24.8	29.7	21	26.7	27.3	27.8	27.8	28.3	28.5	79.2	18.4	3	2.6
9	61.39	24.4	29.6	21.1	26.6	27.3	27.7	27.8	28.3	28.4	82.6	18.7	2.4	2.1
10	61.71	24.6	31.5	20.7	26.4	27.2	27.6	27.6	28.3	28.4	80	18.2	2.9	2.5
11	60.71	24.9	32.4	19.9	26.3	27.3	27.5	27.7	28.3	28.4	78.9	18.3	3.5	2.7
12	60.19	26.1	33.2	20.7	26.3	27.9	27.5	27.8	28.3	28.4	76.1	18.6	4.6	3.3
13	60.50	25.5	31.1	21.6	26.6	27.7	27.6	27.9	28.3	28.4	81.4	19.6	2.3	2
14	60.13	25.1	30.9	19.9	26.4	27.2	27.6	27.7	28.2	28.3	77.9	18.3	3.9	3.1
15	59.85	25.6	30.9	21.7	26.5	27.3	27.5	27.6	28.2	28.5	83.3	20.2	2.7	2
16	60.50	25.3	30.7	22.6	26.8	27.5	27.5	27.6	28.2	28.4	89.5	21.4	7	1
17	61.02	24.9	32.2	20.6	26.5	27.3	27.5	27.6	28.1	28.2	80.3	18.5	3.1	2.1
18	61.54	23.9	26.5	22.6	26.5	26.5	27.4	27.4	28.1	28.2	89.8	19.8	3	9
19	62.20	25	30.9	22.2	26.3	26.9	27.3	27.3	28.1	28.4	83.1	19.5	2.2	1.7
20	62.53	24.7	30.9	22	26.6	27.4	27.3	27.4	28.2	28.4	83	19.1	2.2	1.9
21	61.52	24.3	30.1	20.3	26.3	27.1	27.2	27.4	28.1	28.4	83.1	18.8	2.4	1.8
22	60.02	25.8	31.7	21.8	26.4	27.8	27.2	27.6	28.1	28.4	79.8	19.6	3.2	2.3
23	60.27	24.9	30.4	22.3	27.1	27.8	27.6	27.7	28	28.4	86.3	20.1	1.4	1.1
24	60.33	25.1	30.2	21.8	27	27.7	27.6	27.8	28	28.1	80.2	18.9	2.4	1.9
25	59.78	25.6	31.5	21.2	26.7	27.6	27.6	27.8	28	28.4	79.8	19.3	3.8	3
26	59.54	26.1	31.1	22.2	26.9	28.1	27.6	27.8	28	28.4	82.3	20.6	4.2	3.2
27	60.02	25.5	30.8	22.5	27.1	27.8	27.8	27.9	28	28.4	76.7	18.5	3.5	3.1
28	61.27	24.2	29.2	21.7	27	27.5	27.8	27.8	28.1	28.2	83.1	18.6	2.3	1.8
29	62.42	25.2	31.1	21.4	26.7	27.8	27.5	27.8	28	28.3	76.9	18.1	4.6	3.5
30	63.95	25.1	29.4	21.6	27.2	27.5	27.8	27.8	28	28.2	75.8	17.8	3.9	3.2
31	64.48	24.7	30	20.8	27	27	27.6	27.5	28.1	28.2	75.9	17.3	4.3	3.7
Mean	761.32	25	30.7	21.3	26.7	27.5	27.6	27.7	28.2	28.4	80.9	18.9	2.9	2.4
Total													90.8	72.9
Departure from normal	+0.83	-0.1	+0.8	+0.1							-0.2	-0.3		

Day.	Prevailing direction.	Wind.		Direction at the time of the maximum velocity.	Amount (mean).	Clouds.		Sun- shine.	Rain, 24 hours begin- ning mid- night.	Miscellaneous.	
		Total move- ment.	Maxi- mum hour- ly veloc- ity.			Form and its direction.					
						Upper.	Lower.				
		Km.	Km.		0-10.			h. m.	mm.		
1	W, SSE	141.5	14	W	2.5		Cu.	7 00			
2	W quad.	113.5	13.5	NW	2.8	A.-Cu.	Cu.	7 15			
3	WNW	89.5	15	WNW	3.8	Ci.	Cu.	8 35			
4	NE	59.5	10	W by N	7	A.-Cu.	Cu.	3 35		d° p.	
5	NE quad.	132	13	NE	8.5	Ci., Ci.-S.	Cu., Cu.-N.	1 20	3.3	● p.	
6	NE	156.5	16	SSE	7.8	A.-Cu.	Cu.	4 40	1	p p.	
7	NE	106.5	15	E, ENE	6.2	A.-Cu.	Cu.	6 45			
8	ENE	119	16	ENE	6.8	A.-Cu.	Cu.	2 35	1.8	● a.	
9	NNE	147.5	14	NNW	8.2	A.-Cu.	Cu.-N.	3 30	6	d. a. ●° p.	
10	E quad.	148.5	17	NE	5.8	A.-Cu.	Cu.	5 20	3	p p.	
11	ESE	128	18	ESE	4.6	A.-Cu.	Cu.	7 40	1.3	● a.	
12	ESE	128	18	ESE	3	A.-Cu.	Cu.	8 30			
13	WNW	75.5	10	wnw, NW	6.6	A.-Cu., Ci.	Cu.	5 25	2.5	p° a. p p.	
14	NNE	171	20	NE	7.6	A.-Cu.	N.-cf. ENE	3 30			
15	wnw, wsw	80	12	WNW	6.1	A.-Cu.	Cu.	5 05		●° p.	
16	Variable	58	11	ESE	9	A.-Cu.	Cu., Cu.-N.	2 10	9.3	● a. p.	
17	ENE	96.5	21	N	7.7	A.-Cu.	Cu.	2 55			
18	NNW	45.5	7	NNE, NNW	9.9	Ci.-S.	Cu.	0 00	12.2	● a. p.	
19	W quad.	70	10	NE	8.5		Cu.	2 30			
20	Variable	92	16.5	ENE	8	Ci.	Cu., N.-cf.	2 45		d° a.	
21	NE	90	14	W	9.2	Ci.-S.	Cu. ESE	3 35		○ a.	
22	WNW, SE	114.5	13	WNW	6.9	A.-Cu.	Cu.	6 05		○° p.	
23	SE	71.5	11	SE	8.9	A.-Cu.	Cu.	0 30	3	●° p.	
24	W quad.	84	9	W	9.2	Ci.	Cu.-N.	1 10		d° p.	
25	NE quad.	169	26.5	NE	8.2	Ci.	Cu.	5 15			
26	N quad.	264	23	SW	5.8	Ci.	Cu.	8 35			
27	N	356	25	NNW	8.3	Ci.-S.	Cu. NNE	1 35	1.3	●° p.	
28	N	144.5	20	NNE	8.2	A.-Cu., Ci.-S.	N.-cf. ENE	3 30	1.2	●° a. p.	
29	N quad.	115	21	W	4.9	Ci.	Cu.	6 40			
30	NNE	281.5	25	NNE	9.8	A.-Cu.	N.-cf.	0 10			
31	N	172.5	18	NE	8.8	A.-Cu.	Cu. ENE	2 25			
Mean		129.7	15.9		7.1			4 13			
Total		4,021						130 35	37.8		
Departure from normal		-724.6			+1			-27 02	-22.1		

\* All the mean values given in this table are deduced from hourly observations.

<sup>b</sup> These values are taken from instruments mounted in the Observatory park, 1.5 meters above ground.

## METEOROLOGICAL DATA FOR FIRST AND SECOND CLASS STATIONS.\*

## TAGBILARAN.

[ $\phi=9^{\circ} 38' N$ ;  $\lambda=123^{\circ} 51' E$ ; barometer above sea, 26.2 meters; gravity correction not applied, -1.86 mm.]

Day.	Temperature.					Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Force (mean).	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.				mm.		
1.	759.45	25.8	30.7	22.1	91.8	22.5	NE	0.8	4.3	Ci.-S.	Cu.	E quad.	0.5	d° p p.	
2.	59.92	25.4	30.7	21.8	90.5	22.5	E quad.	1.8	4.8	Ci., Ci.-S.	Cu.-N.	NE			
3.	60.66	25.3	30.5	20.4	90.3	21.2	SSE	1	3.3	Ci.	Cu.	NE			
4.	61.09	25.3	30.7	20.4	90	21.5	N quad.	1.3	7	Ci.-S.	Cu.	NE	2.8	d° a. ● p.	
5.	61.11	25.4	30.7	22.2	89.2	21.3	NE quad.	1.3	7	Ci.-S.	Fr.-Cu., Cu.	NE			
6.	60.67	26.5	32.8	22	83.8	21.1	Variable	1.3	4.5	Variable	Cu.-Cu.	NE, E			
7.	60.24	25.4	28.9	22.3	83.3	21.5	ENE	1.2	9.5	Ci.-S.	Cu.	NE, E		d° p.	
8.	59.49	25.6	30.7	21.8	93.5	22.9	SE quad.	1.2	8	Ci.-S.	Fr.-N. E, ESE			2 d° a.	
9.	59.15	25.7	30.8	22.3	89.8	22	NNE	1.3	7.7	Ci.-S.	Cu.-N. ENE, E				
10.	59.54	26	32.3	20.6	86.2	21.4	Variable	1.3	4.8	Ci.	Cu.	E			
11.	59.11	26.3	31.3	22.5	87.7	22.2	Variable	1	2.5	Ci.	Cu.	SE			
12.	58.74	26.5	32.8	21.2	89.3	22.9	Variable	1.2	3.3	Ci.	Cu.	E			
13.	59.13	25.7	31	21.7	93.3	22.8	NNE	1.3	7	Ci.-S.	Cu.-N. ENE, E		1.8	2 p p.	
14.	58.10	25.5	30.7	21.5	91.2	22.8	NE quad.	1.3	5.7	Variable	Cu.	E	3	● p.	
15.	58.26	25.3	30.3	22.8	95	22.8	Variable	1.7	6.3	Ci.-S.	Cu.	E	34	2 a. 2 p.	
16.	59.33	25.8	30.4	23.1	93.2	23.1	E quad.	1.2	6.2	Ci.-S.	Cu.	NE	5.3	● p.	
17.	59.50	25.5	30.3	21.9	92.8	22.6	Variable	1.2	7	Ci.-S.	Cu.				
18.	59.67	26.5	31	23	90.7	23.2	NE	1.8	3.8	Ci.-S.	Cu.	E			
19.	60.38	26.3	31.3	22.2	87.3	22	SE	1.7	6.5	Ci.-S.	Cu.	ENE			
20.	60.84	24.4	29.5	21.2	94.5	21.5	NE	1	8.7	Ci.-S.	Fr.-N.	E	43.5	2 2 a. ● a. p.	
21.	60.11	24.2	27.3	22.9	96.7	21.7	NNE	1.3	8.7	Ci.-S.	Cu.	E	7.6	● a. p.	
22.	58.82	24.6	29.4	22.2	94.7	21.8	Variable	1.2	7.8	Ci.-S.	Fr.-N., N. ENE, SE		16.5	● p.	
23.	58.89	25.3	29.9	22.5	90.2	21.4	SE, NNE	1.5	7.3	Ci.-S.	Cu.				
24.	58.88	25.4	30.1	22.4	90	21.6	N quad.	1.2	4.8	Ci., Ci.	Cu.				
25.	58.91	26.2	30.3	22.8	91.8	23.1	E quad.	1.2	3.8	Ci., Ci.-S.	Cu.	ENE			
26.	59.19	26.4	29.9	24	91	23.2	SE	1.2	5.7	Ci.-S.	Cu.	E	2.3	● p.	
27.	58.92	25.5	30.8	22.8	94.3	22.8	SSE	1.3	7.7	Ci.-S.	Fr.-N. NE quad.			d° a. p.	
28.	59.50	25.4	31.8	22.1	91.2	22	NNE, SE	1.3	6.3	Ci.-S.	Cu.	ENE			
29.	60.45	25.2	30.9	21.8	93	22.2	NE quad.	1.3	6.7	Ci.-S.	Cu.	E	1.8	d° p p.	
30.	61.76	26.6	31	22.9	89.7	23	Variable	1.7	3.2	Ci.	Cu.	SE, E			
31.	62.31	26	31.9	23	89.3	22.1	NE	1	2.8	Ci.	Cu.	E, SE			
Mean	759.75	25.6	30.6	22.1	91.1	22.2		1	-5.9						
Total													119.1		

## SURIGAO.

[ $\phi=9^{\circ} 48' N$ ;  $\lambda=125^{\circ} 29' E$ ; barometer above sea, 6 meters; gravity correction not applied, -1.86 mm.]

Day.	Temperature.					Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	759.47	26.3	30	22.7	84	21.2	E	194.2	2.8	Ci.	Cu.-N.	N	1.5	d p.	
2.	59.96	24.6	28.1	22.1	91.2	20.9	Variable	123.2	7.8		Cu.-N.		9.3	● a. ● d a. p.	
3.	60.80	26.4	30.5	23.7	83	21	E	282.4	3.2	Ci.	Cu.-N.		10.9	d a.	
4.	61.16	26	29.4	23.5	86.8	21.7	Variable	144	7		Cu.-N.	E	71.6	● a. ● p.	
5.	61.65	24.3	25.1	23.3	92.2	20.7	E, ENE	260.6	10		Cu.-N.		51.9	2 a. ● p.	
6.	60.92	25.7	29	23.1	85.3	20.9	E quad.	398.5	8.3	A.-Cu.	Cu.-N.	E	46.9	● a. ● p.	
7.	60.42	24.4	25.2	22.9	92.8	21.1	NE	203.4	10		Cu.-N.		101.6	p° a. p. ● p.	
8.	59.66	25	28.7	22.9	90.7	21.2	E, ENE	248.5	8.3		Cu.-N.		23.1	2 a. ● a. p.	
9.	59.30	26.4	29	23.6	85	21.7	ENE	435.1	6		Cu.-N.	E	12.9	p° a. ● a. p.	
10.	59.69	27	29.4	24.9	82.5	21.8	ENE	483.5	5.8		Cu.-N.	E	17.2	p° d° p.	
11.	59.69	25.8	29.9	22.3	86.8	21.4	E	227.8	7.7		Cu.-N.	E	10.1	● a. p.	
12.	58.93	26.3	30	23.1	85.8	21.8	E quad.	244.3	5.2		Cu.-N.	E	5	d a. p.	
13.	59.10	25.2	28.1	22.5	91.7	21.8	NE quad.	149.1	8.8		Cu.-N.	E	75.2	d a. ● 2 a. p.	
14.	58.64	24.4	27.5	22.4	94.5	21.5	ENE	178.7	9.7		Cu.-N.	E	62.7	2 a. p.	
15.	58.47	25.4	30.1	23.4	92.3	22.2	E quad.	178.8	9.7		Cu.-N.	E	5.8	p° a. p. p.	
16.	59.41	26.1	30.3	23.1	88.5	22.1	ENE	154.7	6.8	Ci.	Cu.-N.				
17.	59.60	25.6	29	23.1	90.8	22.2	Calm	73.8	7.3		S.-Cu., Cu.-N.	E		d° p.	
18.	59.80	25.6	29.5	23.4	92.5	22.5	E		6.8	Ci.	Cu.-N.	E	38.6	● a. d° p p.	
19.	60.64	26	30.3	23.6	85.7	21.4	E	215.7	6.7	Ci.	Cu.-N.	E	6.4	2 a.	
20.	60.78	26.1	28.2	23.1	85.3	21.4	ENE	436.9	8.2		Cu.-N.	E	79.3	● a. p.	
21.	59.88	24.7	26.1	23.5	93	21.4	ENE	129	9.8		Cu.-N.	E	55.8	p a. ● a. p. d p.	
22.	58.88	24.9	29.2	22.5	93.2	21.8	S, E	98.3	8.5	Ci.	Cu.-N.	E	18.3	● p° p.	
23.	58.91	25.6	30.1	23.5	87.7	21.3	E, NNW	115.2	8.5	Ci.-S.	Cu.-N.	E	1	d a. p.	
24.	58.36	26	30.4	23.2	83.5	20.6	WSW	232.7	8.2	A.-Cu.	Cu.-N.	W		d° a.	
25.	58.44	26.8	31	24.2	85.3	22.2	WSW	204	5.8	Ci.	S.-Cu.	SW			
26.	59.09	26.3	31.9	23.3	87.2	22.2	W quad.	118.9	5.3	Ci.-S.	Cu.-N.	SW	7.1	° a. p.	
27.	58.82	26.3	30.6	23.7	86.5	21.8	SW quad.	134.7	7.3	A.-Cu., Ci.	Cu.-N.	S	26.1	● a. p. p. p.	
28.	59.50	26.4	28.1	24.5	82.5	21.1	NNW	293.1	8.8	A.-Cu., Ci.-S.	Cu.-N.	N	38.4	p < p.	
29.	60.50	26.6	31.5	24.7	88.5	22.8	E, N	247	7.3		Cu.-N.	E	5.5	p° 2 a. ● a. p.	
30.	61.98	26.8	30.5	23.9	84.5	21.8	E	168.2	5	Ci.	Cu.-N.			● a.	
31.	62.67	27.1	30.4	24.4	81	21.5	E		4.7	Ci.	Cu.	E			
Mean	759.84	25.8	29.3	23.4	87.8	21.6		219.8	7.3						
Total													777.7		

\* All the mean values given in these tables are deduced from six daily observations.

## Meteorological data for first and second class stations—Continued.

## CEBT.

[ $\phi=10^{\circ} 18' N$ ;  $\lambda=123^{\circ} 54' E$ ; barometer above sea, 9 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total move- ment in 24 hours.		Form and its direction.	Upper.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	759.49	27	30.5	24.4	68.5	18.1	N, NE	383.8	2.5	Ci.	Cu.	-----	b a. ● a.
2.	59.91	26.8	30.2	24.5	75.2	19.6	N, NE	412.7	3.3	Ci.	Cu. NE, ENE	-----	b a. ● a.
3.	60.89	26.8	30.2	24.5	74.8	19.5	N quad.	362	3	Ci.	Cu. ENE	0.3	b a. ● a.
4.	61.30	26.6	29.6	22.4	75.2	19.4	NE	418.4	5.3	A.-Cu.	Cu.-N. ENE	22.6	b a. ● a. p.
5.	61.47	25.9	28	22.4	81.2	20.1	N, NE	441.6	5.7	Ci., Ci.-S.	Cu.-N. ENE	1.8	b a. ● p.
6.	60.96	26.9	29.8	24	72	18.8	N	379.6	4.3	Ci.	Cu. ENE	2.5	b a.
7.	60.42	25.4	27.6	23.8	87.8	21.1	N, NE	396.9	7.8	-----	Cu.-N. ENE	2.1	b a. p.
8.	59.83	26	29	23.5	81.8	20.5	NE	474.3	5.5	A.-Cu.	Cu. ENE	1.6	b a. ● p.
9.	59.60	26.9	30.4	23.9	76	19.8	NE	476.4	4.2	A.-Cu.	Cu. ENE	1.5	b a. p.
10.	59.94	26.7	30	23.9	76.3	19.6	N, NE	398.2	4.7	Ci.	Cu.-N. ENE	1.8	b a. ● a. p.
11.	59.59	26.8	29.7	23.8	78.3	20.4	N	406.5	3.7	Ci., A.-Cu.	Cu., S.-Cu. ENE	3.8	b a. ● p.
12.	59.03	27.2	30.5	24	77.5	20.7	N, NE	341.1	4.5	Ci.-S.	Cu. ENE	2.1	b a.
13.	59	27.4	30.4	24.8	76.7	20.7	N, NE	366.2	6.3	Ci.-S.	Cu. ENE	11.7	b a. ● a. p. p.
14.	58.59	26.7	29.3	24	78.2	20.3	N, NE	360.2	5.5	Ci.-S.	Cu. ENE	.5	b a.
15.	58.50	27.4	31	25	76.8	20.7	NE quad.	359.2	5.2	Ci.-S.	S.-Cu. ENE	-----	b a.
16.	59.42	27.2	31	25	78.2	20.9	NE	318.2	4.5	Variable	Cu. ENE	3	b a. ● a.
17.	59.40	27.3	30.8	24.2	76.5	20.4	N, NE	310.4	5	Ci., A.-Cu.	Cu. NE, ENE	-----	b a.
18.	59.80	27.7	31.3	24.4	72.8	20	N, NE	336.5	3.2	Ci.	Cu. ENE	-----	b a. $\angle$ p.
19.	60.68	26.6	30	24.1	77.2	19.9	N, NE	364.9	3.2	Ci.-S.	Cu., S.-Cu. ENE	4.6	b a. ● a.
20.	61.11	26.2	29.5	23.8	78.3	19.8	N, NE	351.7	6.2	Ci.	Cu.-N. ENE	2.5	b a. p.
21.	60.37	25.8	27	24	80.2	19.8	NE	303	7.8	-----	Cu.-N. ENE	1.5	b a. ● a.
22.	59.06	26.6	30	23.3	76.7	19.7	NE	316.9	4.3	Ci.	S.-Cu. ENE	2	b a.
23.	58.99	26.7	32	24	75.7	19.6	N	283.3	7	Ci.-S.	Cu. ENE	-----	b a.
24.	58.90	25.7	28.5	23.5	82.3	20.3	SW	185.2	6.2	Ci.-S., A.-Cu.	Cu.-N. NNW	8.1	b a. ● a. ● p.
25.	58.76	26.7	29.9	24.2	82	21.2	SW, SSW	270.3	6.2	Ci.-S.	Cu.-N. N, WNW	5.8	b a. p.
26.	59.22	27.1	31	23.8	79.3	21	S, SSW	158.9	5	Ci.	Cu. WNW	7.1	b a.
27.	59	26.6	29	24.8	84.8	22	S	159.5	6.2	Ci.	S.-Cu. W	1.8	b a. p. p.
28.	59.48	26.4	29	24	78	19.8	NE	304.1	4.8	Ci.-S.	Cu. NE, ENE	-----	b a.
29.	60.75	26.8	30.1	24	78.7	20.5	NE	325.5	5.8	Ci.-S.	Cu. NE	-----	b a. $\angle$ p.
30.	62.02	27.1	30.1	24.2	76	20.1	N, NE	264	3.3	Ci.	Cu. ENE	-----	b a.
31.	62.64	26.9	30.2	24	72.7	18.9	NE	436.9	3	Ci.	Cu. ENE	-----	b a.
Mean	759.94	26.7	29.9	24	77.6	20.1		344.1	4.9			-----	
Total								10,666.4				88.7	

## ILOILO.

[ $\phi=10^{\circ} 42' N$ ;  $\lambda=122^{\circ} 34' E$ ; barometer above sea, 6.5 meters; gravity correction not applied,  $-1.84$  mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
1.	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	759.38	26.4	29.4	23.7	79.7	20.1	N. NE	419	5.5	Ci.-S.	Cu.			☉ d a.	
2.	59.66	26.2	30	22.6	77.7	19.5	N. NE	435.1	2.8	Ci.	Cu.			☉ a.	
3.	60.52	26.2	30.7	23.1	75.7	18.9	N. NE	441.7	3.7	Ci.	Cu.			☉ d a.	
4.	61.19	26.6	30.1	23.2	72	18.3	NE	505.2	3.7	Ci.	Cu.	NE		☉ a.	
5.	61.03	26.7	29.6	23.5	75.5	19.4	N. NE	529.4	7.2	Ci., Ci.-S.	Cu.	NE	2.8	☉ a.	
6.	60.70	26.4	30	23.9	72.2	18.1	N. NE	597.8	3.8	Ci.	Cu.			☉ a.	
7.	60.08	26.2	29	24	76.8	19.4	N. NE	591.4	9.2	Ci.-S.	Cu.-N.		6.6	☉ a.	
8.	59.37	26.2	29.5	23.4	79.3	19.8	N. NE	587.1	6.2	Ci.	Cu.			☉ d a.	
9.	59.29	26.4	29.6	24.3	77.5	19.6	N	605.9	7.5	Ci., Ci.-S.	Cu.		2.3	☉ d a.	
10.	59.73	26.5	30.2	23.7	75.7	19.2	N. NE	487	6.2	Ci.-S.	Cu.	NE	15	☉ d p.	
11.	59.17	26.6	29.9	23.1	77	19.7	N. NE	447.6	4	Ci.-S.	Cu.			☉ p.	
12.	58.87	26.7	30.2	23.5	77.7	20	NE	443.3	3.3	Ci.	Cu.	NE			
13.	58.72	27.1	30.6	24.2	78.3	20.6	N. NE	484.1	6.7	Ci.	Cu.	NE	10.5	☉ p.	
14.	58.35	26.3	30	23.6	81.5	20.5	NE	521.8	8.8	Ci.	Cu.	NE		☉ a. d ☉ p.	
15.	58.32	26.6	30.5	24	82.2	21.1	N. NE	436.4	8.5	Ci.	Cu.	NE	.8	☉ a. d ☉ p.	
16.	59.18	26.9	30.5	24.7	79.8	20.8	NE	417.6	7.2	Ci.	Cu.	NE		d p.	
17.	59.48	26.8	31	24.4	79.7	20.6	N	438	5.8	Variable	Cu.			☉ d a.	
18.	59.58	26.6	31	23.8	79.8	20.4	N. NE	412.4	3.7	Ci., Ci.-S.	Cu.			d a. ☉ p.	
19.	60.38	26.8	30.2	24	77.7	20.1	N. NE	474.7	5	Ci.	Cu.			d a.	
20.	60.72	26.3	30.2	23.1	76.2	19.1	NE	531	5.7	Ci.	Cu.		1	☉ p.	
21.	60.04	25.6	27.7	23.5	83.8	20.5	N	407.1	9.5	Ci.-S.	Cu.-N.			d a. p. ☉° p.	
22.	58.84	26.7	29.1	23.6	79.7	20.6	N. NE	366.5	6.8	Ci.	Cu.				
23.	58.90	26.6	30.9	24	82.2	21.1	N. NE	422.3	6.5	Ci., Ci.-S.	Cu.				
24.	59.03	26	30.5	23	79.5	19.7	NE	347.1	6	Ci.-S.	Cu.				
25.	58.79	26.5	30	23.3	79.7	20.3	SW	155	8	Ci.-S.	Cu.-N.		.5		
26.	58.98	26.8	30.7	23.4	82.5	21.4	Variable	177.4	6.8	Ci.-S.	Cu.			☉ a. ☉ p.	
27.	58.86	26.8	30.3	24.1	82.3	21.4	N	233.4	9.3	Ci.-S.	Cu.-N.		.8	☉ a. d ☉ p.	
28.	59.73	25.8	28.8	23	81.2	19.9	N. NE	447.7	8.5	Ci.-S.	Cu.			☉ a. d p.	
29.	60.85	25.8	29.6	22.9	76.3	18.8	N	494.4	5.7	Ci.	Cu.			☉ p.	
30.	61.88	26.6	30.9	23	82	21	N	318.2	8.7	Ci.-S.	Cu.-N.		23.9	d a. ☉ p.	
31.	62.64	25.4	29	23	84.3	20.2	N	480.6	8.3	Ci.-S.	Cu.-N., Cu.			☉ d a. ☉° p.	
Mean	759.75	26.4	30	23.6	78.9	20		440.5	6.4						
Total								13,656.2					64.2		

**ORMOC.**

Day.	Pressure (mean).			Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Amount (mean).	Form and its direction.						
										Upper.	Lower.					
1.	759.68	25.8	31.8	20.3	79	19.1	Variable	124.4	5.7	A.-Cu.	E	Cu., Cu.-N.	NE	mm.	0 a.	
2.	60.16	24.9	30.6	20.1	86.7	20.2	NE quad.	96.3	6.7	Ci.-S.		Cu.-N.	NE	2.8	0 a. d p.	
3.	60.94	26.6	32.7	22.2	71.3	18.2	NE	154.7	4.8	A.-Cu.	ENE	Cu.	E	0 a.	0 a.	
4.	61.49	25.8	30.1	21.6	81.8	19.9	NE	109.5	9	Ci.-S.		Cu.-N.	NE	1.6	0 a. d p. a. p.	
5.	61.67	25.9	28.6	22.9	79.8	19.5	NE quad.	173.9	8.3	Ci.-S.		Cu.-N.	NE		0 a. 2 p.	
6.	61.14	27.1	35.1	23.6	69.7	18.2	ENE	181.9	7.7	A.-Cu.	ESE	Cu.-N.	NE			
7.	60.66	25.4	30.4	23.6	84.3	20.3	N quad.	128.7	10	A.-Cu.	E	Cu.-N.	ENE	8.9	p a. p d p.	
8.	59.98	26.6	31	23	76.7	19.6	NE	182.8	7.3	A.-Cu.	E	Cu.-N.	E	5.8	0 a. 2 p. 2 p.	
9.	59.76	25.9	31.9	21.7	84.2	20.5	E quad.	119.8	7.3	A.-Cu.	E	Cu.-N.	ENE	8.4	0 a. d 2 p.	
10.	60.06	27.2	33.9	23.9	72.2	19.1	NE	189.4	6	Ci.-S.	NE	Cu., Cu.-N.	E	3	0 a. 2 p.	
11.	59.79	25.9	31.3	21.7	80.8	19.9	N, NE	100.5	6.8	A.-Cu.	SE	Cu.-N.	E	.8	0 a. p d p.	
12.	59.26	26	30.8	22.6	82	20.4	Variable	113.9	7.7	Ci.-S.		Cu.-N.	ENE	13.2	0 a. d 2 p. 2 p.	
13.	59.23	26.6	31.3	22.7	81.3	20.7	Variable	114.6	7.2	A.-Cu.	E	Cu.-N.	ENE, E	7.9	0 a. 2 p.	
14.	58.73	26	30.8	23.3	82.2	20.4	N quad.	122.6	10	A.-Cu.	SE	Cu.-N.	ENE	2.6	d a. p. 2 p.	
15.	58.71	26.8	29.9	24.7	83.5	21.8	Variable	106.5	9.5	Ci.-S.		Cu.-N.	ENE	3	d p.	
16.	59.59	26.3	30.7	23.2	86.2	21.8	N	112.9	6.8	A.-Cu.	E	Cu.-N.	E, ENE	5.1	d a.	
17.	59.79	26	29.8	23.1	87.5	21.7	N quad.	127	7.2	Ci.-S.		Cu.-N.	NE, wsw	15	d a. p. 2 a. 2 p.	
18.	60.02	25.8	30.9	21.8	86.3	21.2	N	157.8	4.8	Ci.-S.		Cu.-N.	NE		0 a. 2 p.	
19.	60.76	26	29.9	22	80.8	20.1	Variable	142.8	9	Ci.-S.		Cu.-N.	ENE	20.1	0 a. 2 p. 2 p.	
20.	61.02	25.9	31.3	23.5	81.7	20.3	N quad.	120.2	7.2	A.-Cu.	E	Cu.-N.	ENE	.3	0 a. p p.	
21.	60.53	25.4	28.4	23.4	88.8	21.4	Variable	71.3	9	Ci.-S.		Cu.-N.	ENE	15.5	0 a. p d p.	
22.	59.20	25.5	29	22.9	89.3	21.6	NW quad.	97.1	9.2	Ci.-S.		Cu.-N.	ENE	1	d a. p.	
23.	59.17	25.9	30.3	22.4	83.7	20.6	NE, NW	90.3	9.3	A.-Cu.	E	S.-Cu.	E		0 a.	
24.	58.74	25.4	29	23.2	88.7	21.3	NW	112.1	9.2	A.-Cu.	E	Cu.-N.	NW	15.5	0 a. p d p.	
25.	58.78	25.2	28	24.4	95.7	22.8	NW quad.	54.8	9.7	Ci.-S.		N.	WbyN	27.7	d a. p. 2 p.	
26.	59.39	25.8	28.5	24.4	92.5	22.8	N	63	8.8	Ci.-S.		Cu.-N.	W	21.8	d 2 a. p 2 p.	
27.	59.13	25.7	28.8	23.5	88	21.5	NW	95.7	8.7	Ci.-S.		Cu.-N.	NW	1.1	d 2 a. p p.	
28.	59.58	26.5	30.9	23.3	74.2	18.9	N quad.	114	7.5	Ci.-S.	E	Cu.-N.	NEbyE	3		
29.	60.91	26	30.1	23.6	88.8	22	NW	118.5	8.7	Ci.-S.		Cu.-N.	ENE			

[ $\phi=11^{\circ} 15' N$ ;  $\lambda=125^{\circ} 00' E$ ; barometer above sea, 3.4 meters; gravity correction not applied,  $-1.82$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.		
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.			
1.	759.69	26.2	31.6	22.9	85	21.2	NW	1.2	5.7		Cu.	NE	7.4	☐ <sup>2</sup> a. ● p.	
2.	60.08	25.7	30.9	23	86.5	20.9	WNW	.6	5.5		Cu.	NE	38.9	● <sup>2</sup> p.	
3.	61.1	26.7	31.5	23	82	21	NW quad.	.7	3.3		Cu.	NE	4.6	☐ <sup>2</sup> a.	
4.	61.76	25.8	29	23.2	85.3	21	NW quad.	.6	8.5		Cu.-N.	NE	35.1	● a. p.	
5.	62.01	25.3	27.1	23.4	86	20.6	NW, E	1.2	7.5		Cu.-N.	NE	1.3	● <sup>2</sup> a. p.	
6.	61.43	26.7	30.9	23.3	77	19.8	E	1.2	8.2	Ci.	SW	Cu.	ENE	2.5	● <sup>2</sup> a. p.
7.	60.68	25.1	29.5	23.6	88.7	20.7	E	.7	8.2		Cu.-N.	E	21.5	● a. p.	
8.	60.22	25.4	29.5	23.3	86.3	20.7	E	1.2	7.5	Ci.-S.	WNW	Cu.-N.	E	15.5	● a. p.
9.	59.96	25.7	29.5	22.6	84.2	20.7	E	.6	6.2		Cu.-N.	N	E	10.4	☐ <sup>2</sup> a. ● a. p.
10.	60.27	26.2	31.5	22	80.5	20.1	E	1.2	4.5		Fr.-Cu.	E	5.3	● p.	
11.	60	26.1	30.4	23.3	85.3	21.4	E quad.	.8	6.7	Ci.-S.		Cu.	E	8.6	● a. ☐ <sup>2</sup> p.
12.	59.46	26	30.5	23.8	87	21.7	Variable	.2	4.2		Cu.	E	18.7	☐ <sup>2</sup> a. ● a. p.	
13.	59.45	26.3	31.2	23.4	85.7	21.6	nw, wnw	1	6.8	Ci.-S.	SW	Cu.	E	13.2	● a. p.
14.	59.08	25.6	29.2	23.6	90	21.9	W quad.	.8	8.5	Ci.		Cu.	E	9.1	● a. p. d p.
15.	58.90	25.4	29.3	23.8	91.2	21.9	E	.3	8	Ci.-S.	SW	Cu.	E	11.2	● a. p.
16.	59.74	26.4	30.2	23.8	86	21.9	WNW	.3	7.3	Ci.-S.	WSW	Cu.	ENE	5.6	● a. p.
17.	59.65	26.4	31.1	24.2	86	21.8	NW	1.3	7.8	Ci.-S.	SSW	Cu.-N.	NE	13.2	☐ <sup>2</sup> a. p.
18.	60.15	26.8	31.7	23.2	83.8	21.8	NW, W	.8	6.5	Ci.	SW	Cu.	E	37.3	☐ <sup>2</sup> a. d a. p.
19.	61.33	24.8	30	22.2	90.7	21	ESE	.7	9.7	Ci.-S.	SW	Cu.-N.	NE	12.5	● a. p.
20.	61.30	25.8	30.4	23.2	86	21.1	E quad.	1.3	7.7		Cu.	ENE	13.7	● a. p.	
21.	60.49	25.2	28.3	23.5	91.5	21.8	NW quad.	.7	8.8	Ci.		Cu.-N.	ENE	8.1	☐ <sup>2</sup> a. p.
22.	59.38	26	29.8	22.6	86.2	21.3	NW	.3	7.2	Ci.		Cu.	E	22.4	● a. p.
23.	59.27	25.7	29.3	23.4	84.8	20.8	NW	1.2	8.5	Ci.		Cu.-N.	ENE	4.1	☐ <sup>2</sup> a. p.
24.	58.18	25.4	28	23.8	87.2	20.9	NW	1.7	9.3		E	Cu.-N., N. NE quad.	22.4	● a. p.	
25.	58.19	26.4	30	23.8	85.7	21.9	WNW	1.8	7.7	Ci.		Cu.	WNW	5.3	● a. p.
26.	59.08	25.9	28.8	23.6	91	22.5	nw, wnw	.3	7.3	Ci.-Cu.	E	Cu.-N.	WNW	5.3	● a. p.
27.	59.10	25.7	29	23.4	89.3	21.9	NW	1	8.3	Ci.-S.		Cu.-N.	NW	1.6	● p.
28.	60.05	25.7	28.9	23.8	82.5	20.1	NW	1	7.7	Ci.-S.	NE	Cu.-N.	NE	3.6	☐ <sup>2</sup> p.
29.	60.90	25.7	29.5	23.2	90.7	22.2	NW	1	8.3		W	Cu.-N.	E	5	● a. ● a. p.
30.	62.33	25.7	29.7	23.6	89.5	21.9	Variable	.5	6.5	Ci.	W	Cu.-N.	ESE	4.3	☐ <sup>2</sup> a. ● a. p.
31.	63.16	25.6	30.4	22.7	86	20.8	NW, ESE	.8	6.2	Ci.	SW	Cu.-N., Cu.	E	1.3	● <sup>2</sup> a.
Mean	760.21	25.9	29.9	23.3	86.4	21.3		.9	7.2						
Total													338.8		

*Meteorological data for first and second class stations—Continued.*

CAPIZ.

[ $\phi=11^{\circ} 35' \text{ N}$ ;  $\lambda=120^{\circ} 45' \text{ E}$ ; barometer above sea, 6.6 meters; gravity correction not applied,  $-1.81 \text{ mm.}$ ]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Amount (mean).	Form and its direction.				
	mm.	°C.	°C.	°C.	P. ct.	mm.	Km.	0-10.	Upper.	Lower.	mm.		
1.	759.89	26.6	30.9	24.6	82.8	21.3	141.7	5.3	Ci.	Fr.-N.	NE	3.6	● p.
2.	60.33	25.9	30.7	23.5	82.8	20.4	115.8	6.2		Variable	NE		
3.	61.13	25.9	30.8	23.2	84.7	20.8	137.3	2.5	Ci.-S.	Cu.	NE		
4.	61.85	26.4	31.3	23.7	78.3	20	162.5	3.3	Ci.-S.	N.	NE	5.8	● p.
5.	61.72	26.7	31.3	22.5	79.3	20.5	264.6	6.7	Ci.-S.	N.	NE		● a.
6.	61.59	26.4	30.8	24.2	77.8	19.8	200.2	4.2	Ci., Ci.-S.	Variable	NE		
7.	61.01	25.8	29.9	23.8	84.5	20.8	213.8	9	Ci.-S.	N.	ENE	15.8	d° a. ● a. p.
8.	60.35	26.1	30.3	23.4	84.7	21.1	257.9	8.3	A.-Cu.	N.	NE	4.6	● <sup>2</sup> a.
9.	60.32	26.5	31	24.2	80.7	20.7	298.3	6.3	Ci.-S.	Cu., N.	ENE, NE	2.6	d° a. ● p.
10.	60.51	26.4	30.9	22	84.2	21.4	247.5	5.7	Ci.-S.	Cu.	ENE, NE	3.8	● a. ● p.
11.	59.88	26.2	30.7	22	86.5	21.7	179.8	5.3	Ci.	Fr.-N.	NE		
12.	59.46	26.7	31	24.2	84.7	22	146.5	3.7	Ci.	Fr.-Cu.	NE	5	d° a. ● p.
13.	59.50	25.9	31.4	24.5	83.8	22	197.2	5	Ci., Ci.-S.	Fr.-Cu.	NE	10.7	● p.
14.	59.07	25.8	30.6	24	89	21.9	202.7	8.5	Ci.-S.	N.	NE	2.8	d° a. ● <sup>2</sup> p.
15.	59.16	26.5	31	24.3	89.7	23	152.1	6.8	Variable	Cu.	NE	3	● <sup>2</sup> ● <sup>2</sup> p.
16.	59.78	26.8	31.2	24.6	85.8	22.3	148	5.7	Ci.	Cu.	ENE		
17.	60.12	26.2	31.3	24	85.3	21.6	185.6	5.5	Ci.	N.	NE, NE		d° p.
18.	60.30	26.5	30.8	24	85.2	21.8	203.2	6.3	Ci.	Fr.-N.	NE		< p.
19.	61.14	25.9	30.5	23.2	88.3	21.8	199.4	6.8	Ci.	Fr.-N.	NE	32.5	● <sup>2</sup> p.
20.	61.48	25.2	29.7	23	90.8	21.6	172.7	6.3	Ci.-S.	N.	NE	12.2	● a. p.
21.	60.64	25.7	29.2	24.2	87.5	21.4	140.3	8.7	Ci.-S.	N.	NE		
22.	59.42	26.2	30.7	23.8	87.3	21.9	126.7	6.3	Ci.	Variable	NE	17.3	● p.
23.	59.72	26	30.4	23.7	87.2	21.7	143	6.8	Variable	Fr.-N.	NE		● a.
24.	59.43	25.8	30.1	24.2	88.7	21.8	197.4	7.8	Variable	N.	NE, NW	5.4	d a. p. ● p.
25.	58.99	26.1	30.8	24.4	87.5	22	243.1	8.2	Ci.-S.	N.	NW	4.1	● a. p.
26.	59.21	26.8	31.2	24.5	85.5	22.3	194.4	5.7	Ci.	N.	WNW		< p.
27.	59.32	25.9	30.6	23.4	88.2	21.9	187	9.2	Ci.-S.	N.	NNE	11.5	● a. ● a. p. < p.
28.	60.22	25.6	29.9	23.7	84.2	20.5	192.5	7.5	Ci., A.-Cu.	N., Fr.-N.	NE	1.5	● a. p.
29.	61.58	25.8	30	23.2	83.2	20.5	183.4	8.8	Ci.-S.	N.	NNE	1.8	< ● <sup>2</sup> p.
30.	62.33	25.9	29.8	23.7	91.8	22.8	205.4	9.3	Ci., Ci.-S.	N.	NE	8	● <sup>2</sup> d° a. p. T° < p.
31.	63.36	24.9	29	23.1	89.8	21	288.6	9.7	Ci.-S.	Fr.-N.	NE	17.5	● a. ● p.
Mean	760.41	26.1	30.6	23.7	85.5	21.4	191.4	6.6					
Total							5,933.6					162.3	

CALBAYOG.

[ $\phi=12^{\circ} 04' N$ ;  $\lambda=124^{\circ} 36' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.80$  mm.]

Day.	Temperature.						Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Relative humid- ity (mean).	Vapor pressure (mean).	Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.		
1.	759.77	24.6	31.4	20.9	87.7	20	N	1	2.5	Ci.-S.	Cu., Cu.-N. NNE	2.6	☉ a. d p.	
2.	60.22	24.5	31.3	20.5	89.7	20.4	N quad.	1.2	2.8	Ci.-S.	Cu.-N. NNE	2.6	☉ a. d a. p.	
3.	61.14	24.9	32.4	20.3	86	19.9	N quad.	1	1.2		Cu. NE		☉ a. d <sup>2</sup> a.	
4.	61.87	24.5	30.9	20.3	87.2	19.8	NE	1.2	5.3	Ci.-S.	Cu., Cu.-N. NNE NE	2.8	☉ a. d <sup>2</sup> a. d <sup>o</sup> p.	
5.	61.95	25.7	32.5	22.5	80.8	19.4	NE quad.	1.2	5.8	A.-Cu.	S.-Cu. NE		☉ p.	
6.	61.53	25.3	32	20.3	78.8	18.4	N, NE	1.3	1		Cu. NE		☉ a.	
7.	60.91	25.5	29.7	23.3	83.7	20.2	NE	1.2	7.8	Ci.-S.	S.-Cu. NE	5	☉ a. ☉ p.	
8.	60.32	25.8	30.3	23.2	85.7	21	NE	1.2	7.5	A.-Cu.	S.-Cu. NE	5.8	☉ a. ☉ p.	
9.	60.31	24.2	29.7	21.2	90.2	20.1	N quad.	1.2	5.2	Ci.-S.	N., S.-Cu. NE	5.1	☉ a. d ☉ p.	
10.	60.38	25.8	32.1	21.7	85.8	21	NE	1	7.2	Ci.-S.	S.-Cu. NE	7.6	☉ a. ☉ p.	
11.	60.06	25.2	30.4	22.1	89.5	21.3	N quad.	.8	6	Ci.-S.	Cu.-N. NE	3	d a. p. ☉ p	
12.	59.50	25.6	32.7	22.3	89.7	21.7	N	1	4.7	Ci.-S.	S.-cf., N. NE	7.3	d a. ☉ ☉ p.	
13.	59.49	26.3	32.4	22.7	85.7	21.6	NE quad.	1	4.8	Ci.-S.	S.-cf., Cu. NE	4.8	☉ a. ☉ ☉ p.	
14.	59.09	25.5	30.3	23.4	89.8	21.7	NE	1	8.8	Ci.-S.	S.-Cu. ENE	1.8	☉ a. d <sup>o</sup> ☉ p.	
15.	58.83	25.1	29.8	22.4	91.3	21.6	N quad.	.7	6.5	Ci.-S.	N. ENE	10.4	d <sup>o</sup> a. ☉ a. p.	
16.	59.75	26	31.7	22.8	87.3	21.6	NNE, ENE	1	6.3	Ci.-S.	S.-Cu., Cu. E	1.3	☉ a. p.	
17.	59.84	25.8	31.5	23.1	89.3	21.8	N quad.	.8	7.8	Ci.-S.	S.-Cu. NNE	5.6	☉ a. p. ☉ p.	
18.	60.18	25.5	32.1	21.4	88.5	21.4	N	1	4.5	Ci.	S.-cf., Cu. ENE	2	☉ a. ☉ ☉ p.	
19.	61.01	25.3	30.8	23.1	87.3	20.8	N	1.2	7.7	Ci.-S.	S.-Cu. ENE	2.3	d <sup>o</sup> a. p.	
20.	61.42	25.3	30.6	23	87.3	20.6	NE quad.	.8	6.5	Variable	S.-Cu. ENE	1	d <sup>o</sup> a.	
21.	60.49	25.5	31.1	21.7	90.7	21.2	N	1	9.5	Ci.-S.	Fr.-N. ENE	20.8	d <sup>o</sup> a. ☉ p.	
22.	59.42	24.8	29	22.4	92.8	21.6	NE quad.	.8	7.2	Ci.-S.	N. ENE	19.3	☉ a. ☉ p.	
23.	59.44	25.5	30.5	21.5	88	20.8	N	1	7.5	A.-Cu.	S.-Cu. ENE	.8		
24.	58.24	24.6	26.8	22.7	92.7	21.3	NW	1	9.8	Ci.-S.	N. N, NNW	60.4	d a. p. ☉ p.	
25.	57.89	25.9	29.2	23.9	91.2	22.5	W	1.2	9	Ci.-S.	S.-Cu. W	3.3	☉ a.	
26.	58.65	26.2	30.2	24.6	91.7	23.2	W	1	8.2	Ci.-S.	S.-Cu. W	.8	☉ a. d <sup>o</sup> p.	
27.	58.92	25.5	28.7	23.7	89.3	21.6	N, NW	.7	6.3	Ci.-Cu.	N. NNW		d <sup>o</sup> a.	
28.	60.04	26	30.7	23.3	80.8	19.9	N	1.2	5.3	Ci.	S.-Cu. NE			
29.	61.17	24.8	30.2	23.3	93.5	21.7	N	.8	9	Ci.-S.	S.-Cu. ENE, NE	8.6	☉ a. d p.	
30.	62.56	25	30	22.9	90.7	22	N	1	8.3	Ci.-S.	S.-Cu. ENE	55.3	d ☉ ☉ p.	
31.	63.31	24.9	30.3	22.6	90.8	21.2	NE	1	7.2	Ci.-S.	S.-Cu. NE	6.6	☉ d <sup>o</sup> ☉ p.	
Mean	760.25	25.3	30.7	22.4	88.3	21		1	6.3					
Total													241.9	



Meteorological data for first and second class stations—Continued.

## LEGASPI.

[ $\phi=13^{\circ} 09' N$ ;  $\lambda=123^{\circ} 45' E$ ; barometer above sea, 5.5 meters; gravity correction not applied,  $-1.77$  mm.]

Day.	Pressure (mean).		Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	mm.	°C.	Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
											Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	759.84	27	31.4	24.2	78.8	20.7	NNE	112.5	1.5	Ci.-S.		Cu.	NE		
2.	60.30	26.9	31.5	23.6	79.3	20.8	NNE	60.4	7			Fr.-Cu.	NE		
3.	61.31	27.5	32	24.1	76.8	20.6	NNE	45.6	2.7	A.-Cu.		Cu.	ENE	d a.	
4.	62.07	27.4	31.6	24.6	76.2	20.4	NNE	261.8	2.3	A.-Cu.		Cu.	NNE	● a. p.	
5.	62.28	26.4	29.8	23.2	81.8	20.9	NE	329.3	4.8	Ci.-S.		Cu.-N.	ENE	5.4 ● d a. p.	
6.	61.83	27.1	31.1	24.7	78.2	20.8	NE	376.9	2	A.-Cu.		Cu.	ENE	4.3 ● a. p.	
7.	61.37	27.3	30.5	24.4	75.2	20.2	NE	405.1	3	Variable	NE	Cu.	NE	4.3 ● a. p.	
8.	60.66	26.8	31.2	23.4	81	21	NE, NNE	396.5	7.2	Ci.-S.		Cu.-N.	ENE	1 ● a. p.	
9.	60.62	26.4	30.1	23.4	81.8	20.8	NE, NNE	438.5	6.2	Ci.-S.		Fr.-N.	ENE, NE	10.4 ● a. d ● a. p.	
10.	61.21	25.3	29.4	23	85	20.3	NNE	333.9	7.8	Ci.-S.		Cu.-N.	ENE	15.4 d a. ● a. p.	
11.	60.22	27.1	31.3	23.6	81.3	21.6	NE quad.	256.6	3.5	Ci., A.-Cu.		Cu.	E	3.3 ● a. p.	
12.	59.89	26.4	31.1	23.4	86.2	22.1	NE quad.	202.6	3.7	Ci., Ci.-S.		Cu.-N.	ENE	28.3 ● a. p.	
13.	59.92	26.8	29.8	24.5	84.3	22	NE, NNE	305.9	5.3	Ci.-S.		Cu.-N.	ENE	13.4 ● a. p.	
14.	59.69	25	27.2	23.5	90.7	21.4	NE	327.7	10	Ci.-S.		Fr.-N.	ENE	17.8 ● a. p.	
15.	59.25	26.4	30.6	24.8	89	22.6	NNE	249.2	6.8	Ci.-S.		Cu., Fr.-N.	ENE	12.9 ● a. ● a. p.	
16.	60.16	26.8	31.1	24.4	84.8	22.1	NE, NNE	188.7	3.3	Ci.-S.		Cu., Cu.-N.	ENE	2 ● a.	
17.	60.05	24.7	26.5	22.9	88.5	20.5	NE quad.	226.1	7.7	Ci.-S.		Fr.-N.	ENE	38.7 ● a.	
18.	60.62	26.3	30.6	23.8	85.7	21.6	NNE	260	6.7	Ci., Ci.-S.		Fr.-N., Cu.-E.	ENE	4.1 ● a. p.	
19.	61.49	25.8	30.2	23.3	86.2	21.1	NE	317.9	8	Ci.-S.		N.	ENE	58.1 ● d a. p.	
20.	61.82	26	28.5	23.4	84.7	21.1	NNE	355.7	5.8	Ci.-S.		Cu.-N.	ENE, E	11.9 ● a. ● a. p.	
21.	60.99	26.2	29.3	24.1	84.7	21.3	NNE	263.3	7.2	Ci.-S.		Cu.-N.	ENE	4.8 ● a. ● a. p.	
22.	59.66	25.7	28.4	23.5	90.2	22	NE	136.3	6.7	A.-Cu.	SE	Cu.	E	16.9 ● a. ● a. p.	
23.	59.66	26	28.7	23.7	82.3	20.5	NE quad.	274.1	7.7	Ci.-S.		Cu.-N.	NE, ENE	7.9 ● a.	
24.	58.86	26	29.2	23.3	82.8	20.7	N, NE	295.7	8	Ci.-S.		N.	NNE	4.4 ● a. ● a. p.	
25.	57.71	26.6	30.2	23.9	85.7	22.1	Variable	170.7	10	Ci.-S.		N.	NNE	1.3 d ● a. p.	
26.	58.02	26.3	30.5	24	87.5	22.2	W, SW	255.9	7.2	Ci.-S.		Cu.-N.	W, WNW	d ● a.	
27.	59.12	25.5	29.4	23.5	84.7	20.5	NE quad.	261.1	8.3	Ci.-S.		Fr.-N.	W	d ● a.	
28.	60.54	25.8	28.8	22.5	74.8	18.4	NE	430.7	4.8	Ci.-S.		Fr.-Cu.	NNE	d p.	
29.	61.65	25.3	27.6	23.4	86.3	20.7	NNE	405	7.7	Ci.-S.		N.	E	24.4 d p.	
30.	62.70	24.2	25.8	22.5	94.5	21.2	NE	365.5	10	Ci.-S.		N.		61.4 ● a. p.	
31.	63.89	24.8	28	22.7	86.3	20.1	NNE, NE	433.7	9.3	Ci.-S.		N.	NE	5.6 d a. p. ● a. p.	
Mean	760.56	26.2	29.7	23.7	83.7	21		282	6						
Total								8,742.9						359.3	

## ATIMONAN.

[ $\phi=14^{\circ} 00' N$ ;  $\lambda=121^{\circ} 55' E$ ; barometer above sea, 4.1 meters; gravity correction not applied,  $-1.74$  mm.]

Day.	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
	Pressure (mean).	Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.	Km.	0-10.				mm.			
1.	760.47	25.8	27.4	24.5	86.2	21.2	NE	511.4	5.8	Ci.	N.	NE	2.6	☉ d° a.	
2.	60.67	24.8	27	21.4	87.2	20.3	NE, N	244.6	4.8	Ci.	Variable	NNE	4.1	d° a.	
3.	61.70	25.4	28	20.7	82.7	19.8	N quad.	297	3	Ci.	Cu.	NE		d° a.	
4.	62.68	26.7	28.8	23.5	79	20.6	NE	433.5	3.5	Ci.	S.-Cu.	NE	3.3	☉ p.	
5.	62.93	25.4	26.8	24.1	88.7	21.4	NW	613.2	9.3	A.-Cu.	NE	S.-Cu.	NE	13.2	☉ d° a. ☉ d° p.
6.	62.71	25.1	27	23.1	87.2	20.7	NE	513.5	9.2	A.-Cu.	NE, E	S.-Cu.	NE	10.1	☉ a. p. d° p.
7.	62.10	26.2	28	23.9	80.5	20.2	NE	600.9	4.5	Ci.		Cu.	NE	2.6	☉ a. p.
8.	61.17	25.8	28.6	24	82.8	20.4	NE	404.8	6.8	A.-Cu.		S.-Cu., N.	E	6.4	☉ a. p. d° p.
9.	61.46	26.2	27.7	25.1	82.3	20.8	NE	688.4	7	A.-Cu.	ENE	S.-Cu.	NE	2.8	☉ a. d° a. ☉ p.
10.	61.71	26.8	28.8	24.9	78.8	20.6	NE	655.2	3.3	Ci.		S.-Cu.	NE	11.2	☉ a. ☉ p.
11.	60.53	26.6	29.5	23.8	86.3	22.2	NE	358.6	6.3	A.-Cu.	E	Cu., N.	NE		☉ a. ☉ p.
12.	60.30	26.9	29.4	25.1	84.5	22.2	NE	331.5	5.7	A.-Cu.	NE	Cu.	NE	2	☉ ☉ p.
13.	60.41	26.8	29.3	25.1	84.8	22.2	NE		4.2	A.-Cu.	ENE	S.-Cu.	NE	5.8	☉ a. d° a. ☉ ☉ p.
14.	60.20	25.6	26.4	24.3	86.8	21.2	NE	681.8	9.5	Ci.-S.		S.-Cu.	NE	4.4	☉ a. d° a. p. ☉ ☉ p.
15.	59.81	26	27.9	24.9	88.2	22	NE	400.2	9.8	A.-Cu.	ENE	S.-Cu.	NE	6.6	d a. ☉ a. p. ☉ p.
16.	60.47	26.6	29.2	25	84.8	22	N	330.4	6.5	A.-Cu.	E	Cu.	NE	.5	☉ p.
17.	61.30	25.2	26.5	23.6	88.3	21.1	NE	608.5	8.5	Ci.		S.-Cu., N.	NE	69	☉ ☉ a. ☉ p.
18.	61.83	24.5	25.5	23	89.8	20.5	NE	791.6	9.8	Ci.-S., Ci.		N.	NE	37.9	d° a. ☉ a. p.
19.	62.65	23.8	24.8	22.8	94.2	20.5	NE	505	10			N.	NE	86.6	☉ a. p.
20.	62.77	24.7	26.8	23.3	89.8	20.7	NE	470	9.7	A.-Cu.	ENE	S.-Cu.	NE	2.1	☉ a. d° a. p.
21.	61.60	25.8	28.4	23.9	88	21.7	NE	283.4	8.2	Ci.-S.	E	S.-Cu.	NE	9.1	☉ p.
22.	60.21	25.4	26.8	23.9	90.2	21.8	N	349.5	9.8	A.-Cu.	NNE	S.-Cu.	NE, N	2.6	d° a. a. p.
23.	60.32	25.2	25.9	24.2	90.3	21.6	N quad.	394.8	9	A.-Cu.	E	S.-Cu.	NE	1.6	☉ a. p. ☉ p.
24.	60.44	26.1	27.3	24.2	83.2	20.8	N quad.	788.8	8	Ci.-S., Ci.		S.-Cu.	NE	5.1	☉ p.
25.	59.49	25.2	25.8	23.8	90.3	21.5	N		10	Ci.-S.		S.-Cu.	NE	15.5	☉ a. p.
26.	59.20	25.9	28.4	23.4	87.5	21.6	NW		6.5	Ci.	NE, ENE	Cu. NNW, NW			d° a.
27.	59.94	24.1	25.9	21.9	90.5	20.2	NE, NW		9.8	Ci.-S.		S.-Cu., N.	NE	9.9	d° a. a. p.
28.	61.25	25.2	28.4	23	79.8	19	NE		6.8	A.-Cu.	NE	S.-Cu., Cu.	NE		☉ a. d° p.
29.	62.78	25.2	26.8	23.9	82.7	19.8	NE	606.5	7			S.-Cu.	NE	7.6	d° a. p.
30.	63.94	24.4	25.4	22.8	92.7	21	NE	607.1	10	Ci.		N.	NE	8	☉ a. p. d° p.
31.	65.02	24.1	25.8	22.5	89.8	20	NE	895.1	10	Ci.		N.	NE	17.3	☉ a. p.
Mean	761.36	25.5	27.4	23.7	86.4	21		514	7.5						
Total															347.9

\*The barometric readings from December 1-5 are taken from an aneroid barometer (barocyclonometer).

## Meteorological data for first and second class stations—Continued.

## AMBULONG, TANAUAN.

[ $\phi=14^{\circ} 07' N$ ;  $\lambda=121^{\circ} 04' E$ ; barometer above sea, 10.5<sup>a</sup> meters; gravity correction not applied, -1.74 mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Force (mean).	Amount (mean).	Form and its direction.					
										Upper.		Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.					mm.	
1.	760.02	25	31	20	80.3	18.6	NE	1	5.7	Ci.-S.	SE	Cu.	E		☉ a.
2.	60.28	25	31.5	19.5	80.8	18.7	NE	1	5.7	Ci.-S.	SSE	Cu.	E		☉ a.
3.	61.34	24.8	30.5	19.5	80.8	18.6	E	1	4.7	Ci., Ci.-S.		Cu.	E		☉ a.
4.	62.22	25.9	30.3	23	78.5	19.4	NE quad.	1.7	6	Ci.-S.	NE	Cu.	E		☉ a.
5.	62.31	25.2	28.3	22.4	81.5	19.3	NE	1.8	7.2	Ci.-S.		Cu.-N.	E		☉ a.
6.	62.02	25.2	28.4	22.5	82	19.4	NE	1.8	6.8	Ci.-S.	NE	S.-Cu.	E	2.5	☉ < p.
7.	61.70	25.6	30.3	22.1	81.5	19.7	NE	2.3	7.5	Ci.-S.		Cu.	E		☉ a.
8.	60.62	26	29.4	23	80.7	20	NE	1.7	8.2	Ci.-S.	NE	S.-Cu.	E	3	☉ a. ☉ p.
9.	60.66	25.6	29.7	23.4	80.7	19.7	NE	3	7.8	Ci.-S.	NE	Cu.-N.	E		☉ a. ☉ p.
10.	60.91	26.2	30.4	23.5	78.5	19.7	NE	2	6	Ci.-S.		Cu.	E	6.1	☉ a.
11.	60.05	26.4	31	22.9	83	21.1	NE	2.2	6.8	Ci.-S.	ESE	Cu.	SE	1.3	☉ d a.
12.	59.57	27	31.5	24	80.8	21.2	NE	1.5	5.2	Ci.-S.		Cu.	SE		☉ a.
13.	59.87	26.8	31	24.5	80.2	20.8	NE	1.7	6.5	Ci.-S.		Cu.	SE		☉ a.
14.	59.50	25.2	28.3	23.5	85.7	20.3	ENE	2.2	7.3	Ci.-S.	ENE	Cu.-N.	SE	7.9	☉ p.
15.	59.26	25.9	30.2	23	84.8	21.1	NE, ENE	1.2	7.3	Ci.-S.	ENE	Cu.	SE		☉ p.
16.	59.94	26.5	30.5	23.5	83	21.3	NE	1.5	7.3	Ci.-S.		Cu.	SE	1	d a.
17.	60.64	25.4	30	21.4	81.3	19.5	NE	1.8	7.2	Ci.-S.		Cu.	SE	3.8	< ☉ a. ☉ d p.
18.	60.88	25	27.7	23.5	84.5	19.9	ENE	2	7.7	Ci.-S.	E	Variable	SE	1.3	< ☉ a.
19.	61.71	24.9	29	23	84.7	19.8	NE quad.	1.7	8.7	Ci.-S.	Variable	Variable	SE	22.7	d ☉ p.
20.	62.09	25	29	22.4	84.7	19.9	NE	2.2	7.7	Ci.-S.		Cu.	SE	.8	☉ d a.
21.	61.18	25.5	30	22.9	82.8	20	NE	1.5	7.5	Ci.-S.		S.-Cu.	SE		☉ a.
22.	59.51	26.6	32	22.4	79.8	20.4	NE	1.7	6.7	Ci.-S.	E	Cu.	SE		☉ a.
23.	59.70	26.2	29.3	23.7	78.5	19.8	NE	1.8	6.8	Ci.-S.		S.-Cu.	SE		< p.
24.	59.89	26.5	30.2	23.1	76.5	19.5	NE	1.8	6.2	Ci.-S.	NE	Cu.	SE		☉ a.
25.	59.43	25.6	30	22	83.5	20.2	NE	1	6	Ci.-S.		Cu.	SE		☉ a.
26.	59.22	26.7	33	21.3	81.3	21	NE	1	6.3	Ci.-S.		Cu.	SE		☉ a.
27.	59.49	26.5	32	23	75.2	19.2	NE, NNE	1.5	7.7	Ci.-S.	ESE	Cu.	SE	1.5	☉ a.
28.	60.82	24.9	29.1	22	79.8	18.6	NE	1.8	7.5	Ci.-S.	E	S.-Cu.	SE		☉ d a.
29.	62.02	25.6	30	22	78.7	19	NE	2.8	6.5	Ci.-S.		Cu.	SE		☉ a.
30.	63.32	25	28	23	83.2	19.5	NE, ENE	2	8	Ci.-S.		S.-Cu.	SE	1	d ☉ a.
31.	63.96	25	28.8	23	76	18	NE, ENE	3.7	7.8	Ci.-S.	ENE	Cu.	SE		
Mean	760.78	25.7	30	22.5	81.1	19.8		1.8	6.9						
Total														52.9	

## PARACALE.

[ $\phi=14^{\circ} 17' N$ ;  $\lambda=122^{\circ} 47' E$ ; barometer above sea, 5.3 meters; gravity correction not applied, -1.73 mm.]

Day.	Pressure (mean).	Temperature.				Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.	Prevailing direction.			Total movement in 24 hours.	Amount (mean).	Form and its direction.					
										Upper.	Lower.				
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	760.62	26.8	29	25	80.5	21.1	NE	276.1	5.5	Ci.		Cu. NE, ENE	1.3	☉ a.	
2.	60.98	25.2	29.8	21.5	85.7	20.1	ENE	117.2	3.2	Ci.		Cu. ENE	0.5	☉ a.	
3.	62	25	30.4	20.6	85.2	20	NE	139	4.5	Ci.		Cu. ENE	13.5	☉ a.	
4.	62.87	25.8	29.5	22.3	83.7	20.5	ENE	215	5.2	Ci.		Cu. ENE	2.1	☉ a. ● a. p.	
5.	63.01	27	30.2	24.5	76.5	20.2	ENE	352.5	5.5	Ci.		Cu. ENE	1.8	☉ a.	
6.	62.82	24.8	28.2	23.5	88.3	20.6	ENE	351.4	8.8	Ci.-S.		S.-Cu. ENE	28.1	☉ a. p.	
7.	62.22	26.2	29.2	23	81.7	20.4	ENE	438.8	5.7	Ci.		Cu. ENE	3.8	☉ a. p. ☌° p.	
8.	61.32	27.2	29.8	23.9	79.8	21.3	ENE	404.2	7.8	Variable.		Cu. ENE	3.8	☉ a. p.	
9.	61.73	26.7	28.8	23.2	78.2	20.2	ENE	551.6	5.7	Ci.		Cu. ENE	9.2	☉ a.	
10.	61.97	27.3	30.2	25	76.7	20.5	ENE	478	6.3	Ci., Ci.-S.		Cu. ENE	13	☉ p.	
11.	60.83	26.4	29.4	24	87.7	22.3	E	279.4	9	Ci.-S.		Cu. E	10.1	☉ a. ● a. p.	
12.	60.46	26.1	29.9	24	88	22.1	E, NE	209.5	8.3	Ci.-S.		Cu. E quad.	15.8	☉ a. ● a. p.	
13.	60.72	26.7	29.6	24.6	86.5	22.5	ENE	347.8	8.8	Ci.-S.		Cu., S.-Cu. ENE	10.7	☉ a.	
14.	60.37	25.7	27.3	24	89.8	22.1	ENE	429.7	9.3	Ci.-S.		S.-Cu. ENE	37.8	☉ a. p.	
15.	59.83	26.2	29.2	24	92.8	23.4	E	204.1	7	Ci.		Cu. E	7.7	☉ a.	
16.	60.76	26.4	29.8	24	88.5	22.5	E	234.5	6.7	Ci.-S.		Cu. E	4.3	☉ a. p.	
17.	61.24	24.5	26.2	23.1	94.2	21.6	NE	401.5	10	Ci.-S.		N. NE	103.9	☉ a. p.	
18.	61.91	24.8	26.8	23.1	90	21	NE	643.1	10	Ci.-S.		N., S.-Cu. NE	34.4	☉ a. p.	
19.	62.42	24.9	26.6	23	91.7	21.4	NE	576.6	10	Ci.-S.		S.-Cu. NE	81.8	☉ a. p.	
20.	62.71	25.8	28.8	23	85.5	21.1	ENE	448.9	10	Ci.-S.		Cu.-Cu. ENE	16.5	☉ a. p.	
21.	61.60	26.2	29.6	23.5	88	22.2	ENE	235	8.3	Ci.-S.		Cu. ENE	14.5	☉ a. p.	
22.	60.11	25.3	28.6	24	94.8	22.7	E, NE	103.4	9.3	Ci.-S.		Cu. E	12	☉ a. p.	
23.	60.34	25.9	29.4	23.5	87	21.5	ENE	245.8	9.3	Ci.-S.		Cu. E	5	☉ a.	
24.	60.25	25.5	27	22.7	85.7	20.8	NE	446.3	10	Ci.-S.		Cu. NE	32.8	☉ a. ● a. p.	
25.	59.10	25.7	27.6	24.5	90.7	22.2	NE, NNW	348.6	10	Ci.-S.		S.-Cu. N	28	☉ a. p.	
26.	58.74	25.8	27.4	24.7	92.8	22.9	NW	178	10	Ci.-S.		Cu., S.-Cu. N	8.7	☉ a. p.	
27.	59.74	25.4	26.6	23.8	86.8	20.9	NNE	291.9	10	Ci.-S.		S.-Cu., Cu. N	8.6	☉ a. p.	
28.	61.39	25.8	28.6	23.5	72.7	17.9	ENE, NE	561.7	8.3	Ci.-S.		Cu. ENE	1.3	☉ a. ● a. p.	
29.	62.80	24.7	27	23.5	88	20.4	ENE	547.2	8.3	Ci.-S.		S.-Cu. ENE	79.8	☉ a. p. ☌° p.	
30.	64.15	24	25	22.4	95.3	20.5	ENE	485.2	10			N. ENE	57.9	☉ a. p. ☌° p.	
31.	65.05	24	25.6	22.5	88	19.6	NE	586.5	10	Ci.-S.		S.-Cu. NE	26.5	☌° ● a. p.	
Mean	761.42	25.7	28.4	23.5	86.5	21.2		359	8.1						
Total								11,128.5					670.7		

<sup>a</sup> This is an approximate height of the barometer above sea level.

**SAN ISIDRO,**

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).		Form and its direction.	Upper.			Lower.
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.		
1.	760.40	25.9	31.8	20.5	76.5	18.5	N	1.5	1.7	Ci.				
2.	60.64	25.5	31.2	19.7	78.8	18.7	N	.7	2				b a. ∞ p.	
3.	61.83	25.7	31.7	20.7	73.8	17.7	E quad.	.7	4.3	Ci.-S., A.-Cu.			b a. ∞ p.	
4.	62.86	25.4	31.7	19.2	74.2	17.6	SE, NNE	.3	3.7	Ci., Ci.-S.			b a. d° p.	
5.	63.08	25.6	30	22	75	18.1	NE	1	8.2	Ci.-S.				
6.	62.92	25.4	30.1	21.5	75	17.8	NE quad.	1	5	Variable			b a. ∞ p.	
7.	62.34	25.1	30	20.7	79	18.3	NE	.5	4.8	Ci.-S.			b a. ∞ p.	
8.	61.68	24.9	29.7	20.7	80.2	18.6	N, NNE	.8	5.8	Ci.-S.			d a. d° p.	
9.	61.88	25.3	30.2	22	77.2	18.3	NE	1.3	7.8	Ci.-S.				
10.	61.99	25.4	30	21.6	77.2	18.4	N quad.	.7	5.2	Ci.-S.				
11.	61.10	25.3	31.6	19.4	78.3	18.4	NE	1.7	2.8	Ci.-S.				
12.	60.36	25.2	31	20.5	82	19.2	NE quad.	1	1.7	Ci.-Cu.			d p.	
13.	60.74	25.5	32.4	21.7	83.2	20	NE quad.	1.2	3.7	Ci.-S.			b a. p° p.	
14.	60.32	25.8	32.5	20.2	76.3	18.4	NE quad.	.5	4.7	Ci.-S.			d a.	
15.	60.02	26.1	30.6	21.9	82.2	20.4	Variable	.7	6.8	A.-Cu.	NE			
16.	60.63	25.8	32.2	22.2	84.8	20.7	Variable	.8	6	Ci.-S.			b a.	
17.	61.02	25.7	32.3	20	80.2	19.4	NE	1	3.8	Ci.			d p.	
18.	61.34	25.4	30.6	21.5	79.3	18.8	E	.7	7	Ci.-S.			b a.	
19.	62.31	25.2	30.7	21.1	80.5	18.9	NE quad.	.8	5.3	A.-Cu.			d a.	
20.	62.63	25.3	30.1	22.1	82	19.6	E	.7	6.2	Ci.-S.			b a.	
21.	61.58	25.3	31.5	21	80	19	E, N	.3	3.7	Ci.				
22.	59.96	26.2	32.3	20.7	78.5	19.5	N, S	.5	4.5	A.-Cu.			b a. ∞ p.	
23.	60.31	26.1	31.8	20.9	81.3	20.3	NE	.8	3.3	Ci., A.-Cu.			b a. ∞ p.	
24.	60.50	25.8	31.9	21.3	81.3	19.8	NE	.8	4.3	Ci.			b a. ∞ p.	
25.	59.90	25.6	31	19.7	82.3	19.9	NE quad.	.7	4.3	Ci.-S.			b a. ∞ p.	
26.	59.77	26	32.2	21.2	81.8	20.2	N, NNW	1.3	4.3	Ci.-S.			b a. ∞ p.	
27.	60.25	25	30	21.4	82	19.1	NW quad.	1.7	4.8	Ci., Ci.-S.			b a. ∞ p.	
28.	61.28	25.2	30.7	21.5	79.3	18.8	NE, E	1.2	4.5	Ci.			b a. ∞ p.	
29.	62.82	24.8	31.3	19	79	18	E quad.	1	5.8	Ci.			b a. ∞ p.	
30.	64.07	25.6	30.5	22.5	77.3	18.7	E quad.	1.2	5.8	Ci., Ci.-S.				

[ $\phi = 16^{\circ} 03' N$ ;  $\lambda = 120^{\circ} 20' E$ ; barometer above sea, 2.7 meters; gravity correction not applied,  $-1.67 \text{ mm}$ .]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.			
										Upper.	Lower.		
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	759.65	26.7	32	22.5	77.8	20	SSE, NW	206.4	0.8	A.-Cu.	Cu.		0 a.
2.	59.98	25.8	31.4	21.6	80	19.6	NE, NW	166.6	1.7		Cu.		1 a.
3.	61.06	26.6	33.8	22	74.8	19.1	E, N	182	4.2	A.-Cu.	Cu.-N.	SSW	0 a.
4.	62.22	26.4	31.6	22	76.2	19.4	Variable	211.1	5.3	A.-Cu.	S.-Cu.	E	0 a.
5.	62.22	26.6	31.7	22.1	78	19.3	Variable		1.2		Cu.		0 a.
6.	62.10	25.9	31.2	22	72.2	17.8	Variable	210.8	2.7	Ci., A.-Cu.	S.-Cu.		0 a.
7.	61.56	25.7	31.3	21	75	18.3	NW quad.	193.2	.7	A.-Cu.	Cu., S.-Cu.		0 a.
8.	60.68	25.8	32.3	20.9	72	17.7	E, SSE	161	3.2	A.-Cu.	Cu.		0 a.
9.	60.61	25.8	33.4	21.9	67.3	16.8	SE	246.2	6.3	Ci.-S.	Cu.		0 a.
10.	60.89	26.7	33.7	21.6	65.2	16.5	SE	252.9	.8	A.-Cu.	S.-Cu.		0 a.
11.	60.16	26.7	34.5	19.9	71.2	17.9	SE quad.	218.4	3.3	A.-Cu.	S.-Cu.		0 a.
12.	59.40	26.7	34.3	22	72	18.4	SSE	212.5	.7	A.-Cu., Ci.	Cu.		0 a.
13.	59.89	26.2	32.8	22	83.3	19.8	SE	125.6	5.7	Ci.-Cu., A.-Cu.	N.	SE	1.8
14.	59.29	26.2	33.3	21.5	73.3	18.6	S quad.	188.2	2.2	Ci.	Cu.		0 a.
15.	59.11	26.2	32.9	21	75.8	19	SE, N	166.1	7	A.-Cu.	Fr.-N.	SSE	0 a.
16.	59.74	27.3	34	22.4	76.7	20.4	N, SE	161.9	6.7	A.-Cu.	S.-Cu.		0 a.
17.	60.14	26.4	31.3	21.9	77.7	19.7	N quad.	185.2	6	Ci.-S.	Cu., S.-Cu.		0 a.
18.	60.40	26.8	34.5	22.9	71	18.4	S	210.8	7.3	A.-Cu.	S.-Cu.		0 a.
19.	61.28	26.8	32.8	23.5	68	17.8	S	241.6	9	A.-Cu.	S.-Cu.		0 a.
20.	61.62	26.5	32.8	22.1	71.7	18.2	S	215.9	4.7	A.-Cu.	Cu., S.-Cu.		0 a.
21.	60.76	27	34.2	22.9	71.8	18.8	SSE, NNW	242	5.2	Ci.	Cu.		0 a.
22.	59.50	26.3	31.4	21.5	75.8	19.1	NW	208.3	.7	A.-Cu., Ci.	Cu.		0 a.
23.	59.70	26.3	30.6	22.6	80.3	20.4	NW	178.6	3.8	Ci.	S.-Cu.	SE	0 a.
24.	59.66	26.5	32.7	21.8	75.7	19.1	SW quad.	170	5.7	Ci.-S.	Cu., S.-Cu.		0 a.
25.	59.32	26.6	31.8	21.3	75.3	19.3	NW quad.	170.7	4.8	Ci.-S.	Cu.		0 a.
26.	59.31	26.5	30.7	22.6	81.8	20.9	NW	324	5	Ci.-S.	Cu., S.-Cu.		0 a.
27.	59.80	25.6	28.8	24	76	18.5	NNW	482	7.3	Ci.	S.-cf.	NNE	0 a.
28.	60.76	24.6	27.5	21.8	81.2	18.6	NW quad.	269.8	8.5	A.-Cu.	S.-Cu.	NNW	0 a.
29.	61.86	25.2	33.3	19.5	74.5	17.5	SE quad.	191.5	2.7	Ci., A.-Cu.	S.-Cu.	ESE	0 a.
30.	63.44	25.4	29.9	21.5	78	18.8	NW	145.9	8	A.-Cu.	S.-Cu.		0 a.
31.	63.59	25.8	32.9	22.1	70.8	17.3	S quad.	137.2	5.5	A.-Cu.	S.-Cu.		0 a.
Mean	760.64	26.2	32.2	21.9	74.9	18.7		209.2	4.4				3.3
Total													

## Meteorological data for first and second class stations—Continued.

## BOLINAO.

[ $\phi = 16^{\circ} 24' N$ ;  $\lambda = 119^{\circ} 53' E$ ; barometer above sea, 9.7 meters; gravity correction not applied,  $-1.65$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.			Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.	
		Mean.	Maximum.	Minimum.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		0-12.	0-10.			mm.		
1.	760.10	27.4	31.1	25.3	74.2	19.9	NNE	3.8	6.2		Cu.	NNE	0.5	● a.
2.	60.30	26.7	31.9	20.4	72.2	18.4	NNE	3.2	5		Fr.-Cu.			○ a.
3.	61.35	27.7	32.3	23.3	72.8	19.8	NNE	3.5	6.7	A.-Cu.	Cu.		3.6	○ a.
4.	62.73	26.2	29.5	23.9	78.5	19.8	NNE	4.7	10		Cu., N.-cf	NNE	1.3	● a. 2° a. p.
5.	62.62	26.8	30	24.4	71.7	18.7	NNE	4.5	9.2		S.-Cu.			○ a.
6.	62.37	26.4	30.6	21	73.7	18.6	SSE, N	2.7	5.2	Cl.-S.	S.-Cu.			○ a.
7.	61.93	26.4	31.3	22.5	78.7	20	Variable	2.3	6.2		Fr.-Cu.	NNE		○ a.
8.	60.91	25.6	31.1	19.7	75.3	18.1	SSE, NNE	2.7	6	Cl.-S.	Cu.	E		○ a.
9.	60.93	26.7	32.3	23.1	73.5	18.9	SSE	3	10	Cl.-S.	S.-Cu.			○ a. 1° p.
10.	61.08	26.1	32.5	21.6	74.2	18.3	S	2.7	4.2	Cl.-S., A.-Cu.	S.-Cu.			○ a.
11.	60.40	26.6	32.8	21.6	70.3	17.8	Variable	3.3	4.2	A.-Cu.	S.-Cu.			○ a. p° p.
12.	59.64	26.6	33.5	20.1	75.3	19.1	SSE	2.8	1	A.-Cu., A.-S.	S.-Cu.			○ a.
13.	60.06	26.8	33.1	21.9	77.5	20	SE quad.	2.2	6.5	A.-Cu.	S.-Cu.			○ a.
14.	59.52	26.9	32.1	23.4	76.2	19.7	SSE	3.5	5	Cl.-S.	Cu.			○ a. 1° p.
15.	59.40	26.9	32.4	22.4	71.2	18.5	NNE	3.8	9.8		S.-Cu.			○ a. 1° p.
16.	60.01	27.4	32.7	22	79.2	21.3	NNE	2.2	7.5	Cl.-S.	S.-Cu.		1.3	○ a. d° 1/2° a. p.
17.	60.38	26.7	31.8	23	78.5	20.3	Variable	3	10	Cl.-S.	S.-Cu.			○ a.
18.	60.70	26.5	32.2	22	77.8	19.9	Variable	2.2	9.8	Cl.-S.	S.-Cu.			○ a.
19.	61.49	26.8	32	22.8	68.3	17.6	SE quad.	4	9.2	Cl.-S.	S.-Cu.			○ a.
20.	61.87	26.8	31.9	23.1	72.5	18.8	SE quad.	3.5	9.8	Cl.-S.	S.-Cu.			○ a.
21.	61.06	27.6	33.1	23.9	70	19.1	SE, NNE	4.2	9.5	Cl.-S.	S.-Cu.			d° a. p.
22.	59.92	26.9	32.1	22.4	77.2	20.1	N quad.	2.8	3.2	Cl.-S.	S.-Cu.			○ a. 1° p.
23.	60.10	27.8	31.5	25.9	74.3	20.6	NNE	4	7.8	Cl.-S.	S.-Cu.			○ a.
24.	60	26.7	31.8	22.8	78	20.1	SE quad.	2.7	9.5	Cl.-S.	Cu.	NNE		○ a.
25.	59.60	26.7	32.1	21.9	78.3	20.2	SSE, NW	2.7	10	Cl.-S.	S.-Cu.			○ a. 1° p.
26.	59.88	26.2	30.9	22	79.8	20.1	NW quad.	3.5	10	Cl.-S.	Fr.-Cu.			○ a. 1° p.
27.	60.66	25.4	28.8	24	76.7	18.4	N	5.5	10	Cl.-S.	Cu., N.-cf.	NW	1.5	2° a. p. ● a. p.
28.	61.02	24.8	27.6	22	79.7	18.4	N, NNW	4	10	Cl.-S.	N.-cf.	N		○ a.
29.	62.09	26.2	31.6	21.9	70.5	17.4	S, NNE	3.8	4.7	Cl.-S.	S.-Cu.			○ a.
30.	63.76	27.2	31.1	25.3	74	19.8	NNE	4.5	9.5	Cl.-S.	S.-Cu.		5.8	○ a. 2° p.
31.	63.98	26.2	30.4	23.9	73	18.4	NNE	4.7	8.2	A.-Cu.	S.-Cu.			● a. 2° a. p.
Mean	760.96	26.6	31.6	22.7	74.9	19.2		3.4	7.5					
Total													14	

## BAGUIO.\*

[ $\phi = 16^{\circ} 25' N$ ;  $\lambda = 120^{\circ} 36' E$ ; barometer above sea, 1,512.5 meters; gravity correction not applied,  $-1.65$  mm.]

Day.	Pressure (mean).	Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours beginning 6 a. m.	Miscellaneous.
		Mean.	Maximum.	Minimum.			Prevailing direction.	Total movement in 24 hours.	Amount (mean).	Form and its direction.				
										Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.	
1.	637.71	17.5	24.5	14.5	82.5	12.2	Variable	238.9	4.4			Cu.	NW	○ a. ≡○ a. p.
2.	37.65	17.8	23.5	13.7	65	9.9	NE quad.	325	2.3	Cl.		Cu.	S	○ a. ≡○ p.
3.	38.59	16.2	22.5	13.3	90	12.3	Variable	280.1	6.6			Cu.-N.	S, ENE	≡ p.
4.	39.46	16.6	20.8	13.9	93.8	13.1	Variable	216.6	5.7	A.-Cu.		Cu.	ESE	○ a. ≡ d° p.
5.	39.38	16.4	23.1	13.4	86.2	11.8	E quad.	199.6	3.6	A.-Cu.		Cu.	ESE	○ a. p.
6.	39.35	17	22.9	14	81.8	11.7	SE	211.5	5.7	A.-Cu.		Cu.-N.	SE	○ a. ≡ d° p.
7.	39.04	17.1	23.7	13.8	76.5	11	SE, E	408.9	2	Cl.		Cu.	SE	○ a. ≡ p.
8.	38.17	17.2	23	13.3	71.2	10.2	E, SE	449	2.6	A.-Cu.		Cu.	E	
9.	38.32	17.3	23.6	14.2	60.5	8.6	E quad.	438	4	A.-Cu.	SE	Cu.	E	
10.	38.58	16.8	22.3	13.3	73.2	10.3	E quad.	469.8	5.6	A.-Cu.		Cu.	ENE	●° a.
11.	38.09	16.9	22.1	12.6	76.3	10.9	E, SE	684.6	3.9	A.-Cu.		Cu.	SE	
12.	37.70	18.7	25.2	14.7	73	11.6	SE	350	1.6	A.-Cu.		Cu.	SE	
13.	37.97	17.4	22.5	16.1	83	12.2	SE quad.	339.5	8.3	A.-Cu.	SE	Cu.-N.	E	2.5
14.	37.40	18	25.4	14.7	65	9.7	E quad.	406.8	.6	Cl.		Cu.		● □ d° p.
15.	37.46	18.4	24.5	14.6	75.2	11.9	Variable	347.2	5.1	A.-Cu.		Cu.	E	○ a. p.
16.	38.08	18.7	24	16.4	85	13.6	E quad.	250.4	6.3	A.-Cu.	SE	Cu.		○ a. ≡ d² p.
17.	38.04	18	24.6	14.4	81.3	12.3	WSW, SE	425.2	6.6	Cl.	S, SE	Cu.	SE	≡ p.
18.	38.14	17.2	22.9	14.8	79.2	11.5	E quad.	439.3	7.7	A.-Cu.	SE	Cu.	E	≡ p.
19.	38.85	17.7	24.6	14.7	75.2	11.2	E quad.	423	6.3	A.-Cu.		Cu.	ESE	□ d° p.
20.	39.11	18.2	24.8	14.5	82.3	12.6	E quad.	396.4	4.4	Cl.		Cu.		≡ d° p.
21.	38.59	17.6	25.5	14.5	86.5	12.7	Variable	386.9	5	Cl.		Cu.		○ a. ≡ p.
22.	37.48	17.9	24.2	14.7	87.7	13.4	Variable	244.6	3.7	A.-Cu.		Cu.		□ a. ≡ p.
23.	37.67	17.6	23.5	14.7	89.8	13.4	SW quad.	298.9	9	Cl.		Cu.	S	4.8
24.	37.68	17.8	23.6	15	84.8	12.8	E, NE	276.6	8.1	A.-Cu.		Cu.	ENE	● ≡ □ d p.
25.	37.31	17.2	23.7	14.6	90.8	13.3	Variable	224.2	7.1	Cl.		Cu.		○ a. ≡ p.
26.	37.31	17.7	23.2	14.6	87.3	13.1	WSW	319.8	8	Cl.-S.		Cu.		○ a. ≡ p.
27.	36.94	16.4	22.2	13.2	85.8	11.5	Variable	274.6	5.1	Cl.		Cu.		○ a. ≡ d° p.
28.	37.31	16	20.6	12.4	84.5	11.2	E quad.	362.3	5.1	Cl.		Cu.		○ a. p.
29.	38.82	15.8	22.3	12.6	82.7	10.9	ESE, E	466.4	1.1	Cl.		Cu.	SSE	○ a. p.
30.	40.38	16.6	21.8	13.5	85	12	Variable	283.2	8.4	A.-Cu.		Cu.-N.	E	○ a. p.
31.	40.46	16.4	22.7	13.5	74.5	10.2	E, SE	463.8	2.7	A.-Cu.		Cu.		≡ d° p.
Mean	638.29	17.3	23.3	14.1	80.5	11.7		351.6	5.1					
Total								10,901.1					11.9	

\*The barometric readings of this station are not reduced to sea level.

*Meteorological data for first and second class stations—Continued.*

**VIGAN,**

[ $\phi=17^{\circ} 34' \text{ N}$ ;  $\lambda=120^{\circ} 23' \text{ E}$ ; barometer above sea, 12.2 meters; gravity correction not applied,  $-1.61 \text{ mm.}$ ]

Day.	Temperature.			Relative humid- ity (mean).	Vapor pressure (mean).	Wind.		Clouds.				Rain, 24 hours be- ginning 6 a. m.	Miscellaneous.
	Mean.	Maximum.	Minimum.			Prevailing direction.	Total move- ment in 24 hours.	Amount (mean).	Form and its direction.				
									Upper.	Lower.			
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.			mm.	
1.	760.14	24.6	29.7	20.7	89.5	20.5	NNW	259.6	0		Fr.-Cu.		≡° a.
2.	60.31	25.1	30.6	20.5	87.3	20.4	N quad.	150.1	2.3	A.-Cu.	Cu. NE		
3.	61.47	25.6	30.7	21.2	89.3	21.6	NW quad.	239.6	3.5	Ci.-S.	Cu. NNW	0.6	
4.	63.41	24.2	28.1	22	89	19.9	NNW	502.9	8.5	A.-Cu.	Cu.-N. NE	.5	≡° a. d° a. p. 4° p
5.	63.11	25.2	28.7	21.8	70	16.5	N quad.	406.6	5.2	A.-Cu.	Cu. ENE		
6.	62.37	25.8	29.7	20.8	72.2	17.8	N quad.	262.1	4.8	Ci.-S., A.-Cu.	Cu.-N. NE		
7.	61.86	24.9	28.3	21.2	79.5	18.4	NNW	381.2	2.8	Ci.-S.	Cu.		
8.	60.88	26.1	31	22.4	70.3	17.3	Variable	140.4	1.7	Ci.	Cu. NNW		
9.	60.95	27	32.6	22	63.5	16.7	Variable	125.9	3.7	A.-Cu.	Cu. SE		
10.	61.07	27.2	32.2	22.5	66.2	17.6	Variable	150.5	1	Ci.-S.	Fr.-Cu. ESE		
11.	60.43	26.2	29.8	21.7	78.5	19.9	W, NW	113	4	A.-Cu.	Cu. NW		d° p.
12.	59.83	26.3	31	22.1	81.3	20.6	NW	106.7	3.5	A.-Cu.	Cu. W		
13.	60.15	26.7	30.9	22.3	83	21.4	W, N	72	4.7	A.-Cu.	Cu. SE W		
14.	59.38	28.1	33.2	24.3	67.7	18.8	Variable	143.1	.8	A.-Cu.	Cu. NE		
15.	59.49	26.7	32.4	21.3	71.3	18.2	Variable	111.2	.8	Ci.	Cu.		
16.	60.21	27.1	32.2	24	80	21.2	W quad.	108.2	5	A.-Cu.	Cu. NNW		1° d° p.
17.	60.62	27.4	33.5	23.2	68	18	NE quad.	268.8	5.2	Ci.-S.	Cu. SE NE		
18.	60.82	27.8	32.6	23.8	54.2	14.9	NE quad.	272	5.3	A.-Cu.	S.-Cu. WNW		
19.	61.55	27.3	31.5	24.3	61.5	16.6	Variable	162.9	2.8	Ci.-Cu.	S.-Cu. SW		○ a.
20.	61.78	26.6	30.8	22.9	69.8	18	NW	145	2	Ci.	S.-Cu.		
21.	61.17	26.6	31	24.1	80.2	20.6	NW	135.5	5.8	A.-Cu.	Cu. SW NW		⊕ a.
22.	59.94	25.4	31.2	21.8	81.3	19.4	NW quad.	169.4	1	Ci.	Cu.		○ p.
23.	60.07	25.6	30.5	22.7	77	18.7	N	273.5	2.7	Ci.-S.	Cu. SW NW		
24.	59.97	25.4	30	21.9	76.5	18.4	NNW	314.2	2	Ci.-Cu.	S.-Cu. SW		
25.	59.62	26.4	31	22.2	78.2	19.8	NW quad.	92.6	5.8	Ci.-S.	Cu. WNW		
26.	59.98	25.7	31.7	22.3	78.7	19.3	N	283.8	3.8	Ci.-S.	Cu. WNW		
27.	60.87	22.7	27.8	20.2	86.3	17.5	N	418.1	5.8	Ci.-S.	Cu. N	2.3	✓° d p.
28.	60.91	24	28.3	18.9	80.2	17.5	W, NNW	93.7	3	Ci.	S.-Cu.		
29.	62.34	25	29.4	19.4	73.8	17	NW	93.2	1.8		Fr.-Cu.		
30.	63.88	25.4	30.2	21.6	73.8	17.7	N quad.	263.1	7.5	A.-Cu.	S.-Cu. SW		
31.	64.64	24.7	30.4	21.8	68.7	15.7	N	280.3	7.7	A.-Cu.	S.-Cu. SW		
Mean	761.07	25.9	30.7	22	75.7	18.6		210.9	3.7				
Total								6,539.2				3.4	

**TUGUEGARAO,**

[ $\phi=17^{\circ} 36' \text{ N}$ ;  $\lambda=121^{\circ} 40' \text{ E}$ ; barometer above sea, 23 meters; gravity correction not applied,  $-1.61 \text{ mm.}$ ]

Day.	Pressure (mean).				Temperature.		Relative humidity (mean).	Vapor pressure (mean).	Wind.		Clouds.			Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure.	Mean.	Maximum.	Minimum.	P. et.	mm.			Prevailing direction.	Force (mean).	Amount (mean).	Form and its direction.			
												Upper.	Lower.		
1.	761.44	24.2	29.8	20.5	86	19.2	NW, NE	0-12.	0-10.				mm.	0° a.	
2.	761.48	23.8	29.8	20.9	89.3	19.5	Variable	1.3	1.8				1	0° a.	
3.	762.52	24.6	30.6	21.7	88.7	20.3	Variable	1.7	5.2	Ci.-Cu.	E		4	0° a. 0° p.	
4.	764.58	22.6	25.1	20.5	94.3	19.4	NW	3.7	3.2					0° a. 0° p.	
5.	765.98	21.9	26.2	20	89.8	17.7	NW	3.7	7.3	A.-S.				0° a. 0° p.	
6.	765.16	22.5	26	19.9	90.7	18.3	NW	1.8	9					0° a. 0° p.	
7.	764.26	23	27.6	21.2	92.3	19.3	W, NE		9.7				5.1	0° a. 0° p.	
8.	763.68	23.1	27.6	21	91.5	19.3	NE		9.2					0° a. 0° p.	
9.	763.82	23.8	29.9	20.8	85	18.4	NE, NW		7.2	Ci.			1.8	0° a. 0° p.	
10.	764.06	22.5	26.5	19.4	91	18.5	ENE, SE		8.2	Ci.-Cu.				0° a.	
11.	762.56	24	29.9	20.4	90.7	20	SE		8.8	Ci., A.-S.			4	0° a. 0° p.	
12.	761.45	25.7	32.3	22	86.8	21.2	SE		5.7	A.-S.				2	0° a. 0° p.
13.	762.26	24.4	26.7	22.3	93.5	21.2	Calm	0	7.3					2.5	0° a. 0° p.
14.	762.51	24	29.9	20.4	87.3	19.2	NE		6.3					1.3	0° a. 0° p.
15.	761.29	24.7	30.5	21.3	86.5	19.9	SE, NE		8.5	A.-S., Ci.-S.				2	0° a. 0° p.
16.	761.18	25.8	32.5	22.2	90.8	22.4	S, SE		8.2	A.-S.					0° a. 0° p.
17.	763.18	22.6	24.5	20.4	92.8	18	NW	2.7	8.7						0° a. 0° p.
18.	764.40	22.1	25.7	20.2	87.2	17.2	NW	3.2	9						0° a. 0° p.
19.	764.64	22.8	28.5	21	87.3	18	NE, NW	1.3	5.3	A.-S., Ci.-Cu.					0° a. 0° p.
20.	764.16	23.6	29.8	20.2	87	18.7	NE		7.3						0° a.
21.	762.26	25	29.8	21	84.8	19.7	S		6.2	Ci.-Cu.					0° a.
22.	761.31	25.2	33.4	20.6	84.2	19.8	Variable	1	6.2						0° a.
23.	761.58	24	32.8	21.5	88	19.8	NW quad.	1.7	7.3	Ci.					0° a.
24.	762.27	24	28.6	21.5	85.2	18.8	NW	1.3	8.3	A.-Cu.					0° a.
25.	761.46	23.7	27	21.6	84.7	20.2	NW	1	10						0° a.
26.	760.10	24.7	30.7	20.2	84.7	19.5	N quad.	2	6.8	Ci.-S.					0° a.
27.	760.99	22.4	27	20.2	90.3	18.1	N quad.	2	6.8	Ci.-S.	E				0° a.
28.	762.50	22.5	28.5	18.9	83.8	16.9	NW	2	5.2	Ci.					0° a.
29.	764.54	22.1	26.4		81	17.9	NE, N	3	6.8						0° a. 0° p.
30.	765.96	22.8	27.3	19.6	88.8	18.3	N quad.	1.2	9.3	Ci.					0° a. 0° p.
31.	767.84	21	24.5	18.7	83.7	15.5	NW	4.3	8.3						0° a.
Mean	763.04	23.5	28.4	20.6	88.6	19		1.2	7.4						
Total													50		

*Meteorological data for first and second class stations—Continued.*

**APARRI.**

[ $\phi=18^{\circ} 22' N$ ;  $\lambda=121^{\circ} 38' E$ ; barometer above sea, 5 meters; gravity correction not applied,  $-1.57$  mm.]

Day.	Pressure (mean).			Temperature.			Relative humidity (mean).	Vapor pressure (mean).	Wind.		Amount (mean).	Clouds.		Rain, 24 hours beginning 6 a. m.	Miscellaneous.
	Pressure (mean).	Mean.	Maximum.	Minimum.	Prevailing direction.	Total movement in 24 hours.			Form and its direction.						
									Upper.	Lower.					
	mm.	°C.	°C.	°C.	P. ct.	mm.		Km.	0-10.				mm.		
1.	761.62	24.9	28.2	22.2	80.5	18.8	NE	249.7	2.5			Cu.-N.	25.4	☉ a. ●° p.	
2.	61.52	23.9	27.5	21.3	87.2	19.1	NE	394.9	7.8			Cu.-N.	19.8	● a.	
3.	62.54	24.9	28.2	22.6	86	20	NE quad.	298.2	8.2	Ci.-S.	E	Cu.-N.	21.6	☉ p.	
4.	65.20	22.4	25	21	91.5	18.4	NE	684.4	10			N.	33.4	● a. p.	
5.	66.53	21.3	23.5	19.6	90.3	17	NE	616	10			N.	8.3	● a. p.	
6.	65.50	21.9	23.8	19.5	92.5	18	NE	568.7	10			N.	56.7	● a. p.	
7.	64.61	21.6	23	20.5	94	18	ENE	490.7	10			N.	78.3	● a. p.	
8.	63.60	22.5	24.9	20.4	90.7	18.4	S quad.	179.5	9.5	A.-Cu.		S.-Cu.	1.1	● a.	
9.	64.03	23.4	26.5	20.6	82.8	17.5	E quad.	297.8	5.2	A.-Cu.	SE	S.-Cu.	SE		
10.	63.93	23.2	26.1	20.1	85.8	18.8	E. ENE	280	9.7	A.-Cu.		S.-Cu.	SE		
11.	62.43	23.7	27.4	21.1	91	19.5	Variable	152.5	8.3	A.-Cu.	S	S.-Cu.	2.6	● p.	
12.	60.99	24.8	29.8	21.6	87.5	20.3	SE quad.	298.6	3	A.-Cu.		S.-Cu.	3.5	● a. p.	
13.	62.29	24.8	27.1	22.5	87.5	20.4		233.7	10	A.-Cu.		S.-Cu.	4.3	☉ a.	
14.	62.26	24.8	28	21.6	83.8	19.4	E quad.	240.1	1.7			S.-Cu.	5	☉ a.	
15.	61.06	24.7	29.2	21.4	85.7	19.7	SW	192.4	5	A.-Cu.	E	S.-Cu., Cu.-N. E, SE		☉ a.	
16.	61.40	25.4	29.7	21.9	85	20.5	E quad.	3.2	3.7			S.-Cu.	ENE	☉ a. < ● p.	
17.	63.97	22.7	25.2	20.5	89.7	18.4	NE	732.7	10			S.-Cu.	NE	● a. p.	
18.	64.84	22.3	24.4	20.6	82	16.4	NE	691.3	10			Cu.-N.	NE	☉ a. p.	
19.	65.04	22.7	25.7	20.1	83.3	17.1	E	369.4	9.7	Ci.-Cu.	E	S.-Cu.	2.2	☉ a.	
20.	64.27	23.4	26.4	20.6	84.5	18	Variable	172.5	9.8			S.-Cu.	E		
21.	61.98	24.8	28.8	21.1	83.5	19.3	S	234.9	7.7	A.-Cu.	SW	S.-Cu.	E	☉ a.	
22.	60.33	25.1	29.5	22	83.5	19.7	Variable	178.2	1			S.-Cu.		☉ a.	
23.	62.10	24.2	26	22.5	81.5	18.2	NE	417.8	7.5			S.-Cu.	NE	● p.	
24.	62.67	22.7	23.8	21.1	92.7	18.9	NE	522.6	10			N.	35.9	● a. p.	
25.	61.60	24.3	26.5	21.8	84.8	19.1	E	425.1	9.2	A.-Cu.	E	S.-Cu.	NE	☉ a.	
26.	60.38	24.6	28.1	21.4	85	19.4	N quad.	295.6	6	Ci.-S.	SW	Cu.-N.	N	☉ a.	
27.	61.25	23.1	25.9	21.5	85.3	17.9	NE	358.4	9.5			S.-Cu.	NE	● a. p.	
28.	62.84	22.8	24.6	20.6	78.3	16.1	E	491.2	9.2	A.-Cu.	SE	S.-Cu.	E	☉ a.	
29.	64.68	22.4	25.2	19.8	84.3	17	SE		8.7			S.-Cu.	E	☉ a.	
30.	66.55	23.3	27.2	19.7	84.2	17.7	SW, NE		9.8			S.-Cu.	E	4.5	
31.	68.94	20	21.8	18.2	89.8	15.6	NE		10			N.	NE	24.1	
Mean	763.26	23.4	26.4	20.9	86.4	18.5		370.7	7.7						
Total														410.3	

## DAILY RAINFALL FOR THIRD-CLASS AND RAIN STATIONS, DECEMBER, 1913.

Station.	Day of month.															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	1.5	mm.	mm.	mm.	mm.	mm.
Isabela, Basilan			.8				116.1	2.5			4.8			24.4	43.7	
Zamboanga							5.6	1.8		.3				.5		
Davao	19			17.8	14		51.1	8.6		24.1					16.5	
Cotabato					21.8		15		.8	20.1						
Butuan		.3		2	.8	8.4	2.5	15	12.7	4.1		.8		7.9	25.2	5.6
Dumaguete				1.9		.8	10.7	2.6					1.3	3.3		2.8
Yap, W. Carolines			.5	3.3	2.8	1.3				.8	.8	16.5	2.8	1	32.3	4
Maasin		9.9		32.8	49.3	19.8	38.1	16				12.7			9.9	
San José Buenavista															.3	
Cuyo																
Guiuan	2	2.5	10.4	22.1	27.6	7.1	36.3	.5	11.9	1.1	9.7	8.2	25.9	18.1	12.2	15.5
Borongan	1.3	1	6.4	26.7	11.2	25.4	54.6	17.2	24.6	30.7	54.6	18.8	45.2	8.9	23.3	7.1
Masbate				1.5				5.3	33.6	13.2	1.3	.3	.8	19.3	.5	
Romblon				2	.3	.5	26.7	9.9	4.6	3.8		2.3	22.9	27.2	.5	9.4
Batag		4.5					27.1	1.5	20.6	9.7		9.4	20.6	11.7	16.5	22.9
Gubat		1.5				2.8	5.3	1	7.6	18	4.6	7.6	24.1	21.8	9.6	
Sumay, Guam	.8	1.8	2.5	.8	12.7	5		1.3	3.8	1.3	.8	11.4		59.7	1	1.3
Calapan	1				2.1	3.6	1.3	18.8		1.5	22.4	.3	8.4	16.8	1	.3
Virac	.8		2.3	1.3	1.8	2	.8	5.6	2.1	7.1	2.6	5.9	25.9	17.6	16	1.8
Nueva Caceres	.2									8.4		1	33	7.4	7.8	
Batangas	1.8	2.3			.5	.8		3.8							.5	
Silang				2.8		1.8	1			5.1	8.9		10.2		1	
Santa Cruz, Laguna				1.3	.8	2.8	.6	5.3	.4	3.8	2.6	5.4	6.1	19	10.2	
Antipolo				3.8					.8	1.3	1.5			1		1.3
Iba	.6												16.5			.8
Tarlac				36.8									.8			
Baler		1	.1	2	1.4	1	2	12.7	4.1	4.1	27.2	10.4	23.8	1.3	13.7	.3
San Fernando, Union				1.3				.5								
Echagüe		1.3	2.3	14.2	5.6	8.6		12.4		4.1	4.3	.5	2.5	1.3	.8	
Candon																
Laoag																
Santo Domingo, Batanes	16.5	42.7	46.8	3.2	36.8	9		18.2				.3	.8	53.1	8.5	46.7

Station.	Day of month.																Total.
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.		
Jolo	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
Isabela, Basilan	6.4	.3		.3		6.4	17.8	11.7	3.1	6.3	1.3	8.1		19.1		156	
Zamboanga		16				4.1				1.5			5.1	.8		146.1	
Davao			24.4				2						4.8	8.9		48.3	
Cotabato		15.7					28.4									230.5	
Butuan		13						.3		8.1			1			98.9	
Dumaguete		2.1	5.6	19.6	8.1	40.1	1	.5		6.1	1.3	52.8	1.3	.3		266	
Yap, W. Carolines				7.6	2.5	5.1		13.5		.5	3.6					56.2	
Maasin	2.8		9.9	9.2	24.1	7.3	1			5.1	1.6	1	.8	.3		129.2	
San José Buenavista				47	11.2			15.2		23.9		14.7				300.5	
Cuyo						5.1		.8	3.3	25.9	.8			10.2		46.4	
Guiuan	.5	2.8	47.8	31.7	24.4	1.8	8.9	8.7	1	9.4						10.4	
Borongan	4.6	47.8	80.1	18.5	39.4	.3	16.6	14.7	.8	.5	1.3	53.3	31.5	17.2	10	412.5	
Masbate	1.8	.3	7.6	1.8	1.6	4.6	1.5	8.7					18.6	57.7	8.7	693.6	
Romblon	2		51.1	9.9	1.5	.8		4.8			3	.8	1.3	24.3	11.9	188.7	
Batag	24.9	10.9	44.4	1.5	31.2	15	23.4	13.9	4.3	1.5		11.4	27.9	22.6	10.7	222.3	
Gubat	11.7	37.4	55.9	5.8	18	41.4	19.8	37.3	14.2		1.5		66.3	10.2	37.8	388.1	
Sumay, Guam	6.4	55.9		8.9	1.8	10.2									1.3	461.2	
Calapan	9.7	.6	6.1	12.7		10.2	.8	1	.3		.5	.8	.5	17	7.6	187.7	
Virac	38.6	36.1	36.3	4.5	11.9	8.2	2	8.6	1.6	5.8	.3		31.5	57.4	8.4	145.3	
Nueva Caceres	80	1	3.8		2.5	2.9	5.5	33.2	6.5	8.3			23.4	40.7	.1	344.8	
Batangas	6.6	1.8	4.9				12.9		.5							265.7	
Silang			9.7	5.6									1.3	.3		38	
Santa Cruz, Laguna	6.6	20.1	37.6	2.6			1.6	1.3			.8	.5	.3			47.6	
Antipolo	5.6	5.1	2.5			5.6			.8			2.3	.3	.8		129.7	
Iba		.3														32.4	
Tarlac	3.8															18.2	
Baler	1.3			14.7		2.8	.3					3.3	7.9	.5		41.4	
San Fernando, Union											2.8			1.5		135.9	
Echagüe	6.6					6.4	2.8	2.5	6.9	1.8				17.3	1	6.1	
Candon																103.2	
Laoag										2.3	5.8					0	
Santo Domingo, Batanes	3.6	2.6	4.8		.7	7.6	13.4	25.9	3.1	11.1	27.9	19.7	6.2	21.6	6.4	8.1	
																439.2	

## MAXIMUM AND MINIMUM TEMPERATURES FOR THIRD-CLASS AND RAIN STATIONS, DECEMBER, 1913.

Day.	Jolo.		Isabela, Basilan.		Zamboanga.		Davao.		Cotabato.		Butuan.		Dumaguete.		Yap, W. Carolines.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	31.2	21.7	33.4	22.3	30	21.9	31.2	21.9	35.1	22.6	28.2	24	31	23.7	33.2	23.6
2	31.5	22.6	34.1	22.6	30.4	23.4	31.8	22.3	35.7	23.2	28	21.4	30.6	22.6	32.1	23.6
3	29.7	22.8	33.6	22.6	31	23.5	30.2	22	33.9	22.7	29.5	22.2	29.4	24.4	33.2	24.5
4	30.4	21.6	34	22.1	31	22.8	31.2	21	35.1	21	29.2	21.1	29.4	23.2	32	24.5
5	31.3	22.8	32.6	22.1	30.8	22.1	30.7	21.3	34.8	21.4	27	22.7	30	23.7	30.9	23.6
6	31.8	21.7	33.6	23	31.4	23.9	30.7	21.8	33.9	21.8	28	22.6	29.3	24.6	32	24
7		21.7	33.6		32	22.5	30	21.8	33.8	22.5	26.5	23.3	28.5	25.6	32.2	25.5
8		22.2	32.1	21.6	31	22.6	26.5	21.8	31.1	21.5	25.8	22.9	29.1	23.8	32.5	24.4
9		22.5	32.6	21.67	32	23.4	30.7	21.4	34.5	21.6	28.6	21.2	29.7	23.6	33.2	24.8
10		21.3	32.4	22.6	30.7	22.5	31.5	22.2	34.6	22.2	28.1	22.4	30.7	25.3	32.2	25.8
11		22.2	33.1	23.1	31	22.5	32.2	20.9	33.3	21.2	28.6	21.9	29.8	24.2	32.2	25.8
12		21.9	32.1	21.67	30.5	22.4	31.8	21.4	35.1	22.1	28.5	23.2	30.2	24.8	31	24.8
13		22.3	31.37	22.3	30.1	23	30.7	21.5	35.2	22.1	27.3	22.6	30.8	24.8	31.7	24.8
14		21.8	32.1	22.1	31	22.6	30.7	21.1	34.4	22	27.3	21.9	29.3	22.1	31.2	24.5
15		21.5	31.8	22.1	30.6	23.2	30.7	21.5	34	21.4	29	22.9	29.8	24.2	31	23.1
16		21.8	32.1	22.3	30.4	22.6	30.17	22.9	35.7	23.2	28.7	23.5	30.5	25.2	30.1	25
17		22.1	32.6	22.5	29.9	24	31.2	22	35.4	22.6	28.6	21.4	30.7	23.9	30.8	24.9
18		21.5	33.3	23.1	31	22.3	31.2	21.7	35.7	22.2	29.5	22.4	30.3	22.3	30.7	24.6
19	30.4	22.8	31.4	23.1	30.8	21.1	26.7	22.1	32.1	21.5	26.7	23.6	29.5	24.2	32.3	24.8
20	30	24.9	32.6	21.1	30.5	22.5	27.8	21.5	32.5	21.7	26.6	21.4	30.1	23.8	31	22.7
21	30.8	21.8	32.8	21.6	29.1	22.5	28.2	21.6	30.3	21.3	25	22.7	28.1	22.9	29.1	23.4
22	30.3	24.1	30.4	22.3	30.8	22.8	30.7	21.9	34.2	22.9	27.5	22.6	30.5	23.8	29.3	22.3
23	29.8	23.2	29.1	22.6	28	22.9	30.5	22.1	32.7	22.2	27.6	23.2	30.2	23.8	31.7	25
24	28.7	22.9	32	22.1	29.6	22.1	29.7	20.9	32.8	21.6	28	23.1	31.2	23.8	31.2	25.9
25	31	22.2	31.6	22.6	29.5	22.5	30.2	22.2	31.6	23.1	28.6	22.5	30.4	21.9	31.3	24.7
26	31.7	22.2	30.2	21.1	28.6	23.5	30.7	21.5	27.6	22.1	28.8	22.4	30.8	22.6	31	25.4
27	30.9	24.3	29.6	23.6	29.1	23	31.2	22.8	31.8	22.7	28.5	23.9	29.1	22.7	30.7	24.1
28	29.8	24	31.2	21.6	30	23	30.5	22	34.2	22.9	27.5	23.6	29.5	23.5	31.7	24
29	29.8	24.6	33.1	23.3	31	22.6	30.7	22.9	33.3	23.1	28.2	23.7	29.5	24.3	30	24.1
30	30.7	24	30.8	21.6	29.7	23.9	31.7	22	34.7	22.3	29.1	23.3	30.3	24.8	31.2	23.6
31	30.4	21.1	32.8	23.1	31.1	22.7	31.3	21	34	21.1	28.8	21.6	29.8	24.7	31.2	24
Mean	30.5	22.5	32.2	22.3	30.4	22.8	30.4	21.8	33.6	22.1	28	22.6	29.9	23.8	31.4	24.4

Day.	Dapitan.		Maasin.		San Jose Buenavista.		Cuyo.		Guiuan.		Borongan.		Masbate.		Romblon.	
	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.	Maxi-mum.	Mini-mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	32.7	23.9	31.2	21.6	32.6	22.6	29.4	25.7	30.7	25.5	30.5	20.2	31	25.5	31	21.7
2	30.5	22.6	29.4	21.2	31.1	21.1	29.5	25.7	30.4	23.5	31	22.5	31.2	25.2	31.2	22.7
3	31	25.3	30.6	21.6	19.8	19.8	30.5	25.5	31.3	25.5	30.6	22.5	31.6	25	31.6	21.5
4	30.9	24.5	31	22.6	19.5	19.5	29.9	25.6	29	24	28.6	22.5	31.6	23.6	31.6	23
5	31	23.8	30.7		32.9	19.9	29.6	25.9	27.8	23.3	30.3	22.5	31.2	23.5	31.8	23.2
6	30.1	25.5	30	22.5	35.7	20.3	29.8	25.6	30.9	23.2	30.3	22.5	30.8	24.5	32	24.2
7	30.9	25	30.7		33.7	21.6	29.6	25.5	29.3	23.5	29.8	22.5	31	25.6	31.4	23.8
8	29.5	24.8	31.4	22.4	32.7	22.9	29.9	25.6	30.5	22.4	28.6	22.1	28.8	25	32	23.2
9	30.4	24.8	31.2	22.5	35.1	22.6	29.6	25.5	30	25.5	28.6	22.1	30.8	25	31.8	23.1
10	29.8	25.4	30.8	22.7	35.7	22.6	29.7	25.6	30.9	24.5	30.6	23.6	30.2	23	31	23.8
11	30.4	24	31	23	35.3	22.4	30.3	24.9	29.9	24.2	29.5	21.8	29.4	23.4	31.2	23.4
12	30.4	25.2	30	23.3	33.2	22.2	30	25.8	31.4	25.3	30.3	23	29.5	24.2	31.8	25
13	30.5	25.1	31	23.6	32.7	22	30.6	26.1	30.4	26	31	23.4	31.4	25.4	32.7	24.1
14	30.7	24.8	30	23	33.2	22.1	29.4	26.1	29.4	23.4	31	22.9	31.4	25.4	32.7	23.8
15	29.97	24.7	29.8	23.97	33.7	22.6	30.2	25.5	31	24.8	28.9	23.6	27.8	25.27	31.2	23.7
16	30.6	22.1	29.4	23.6	32.9	23.5	30.7	26.3	30.9	24.5	30.4	23.6	31.2	25.4	31	24.9
17	30.1	24	28.9	23.4	32.8	22	30.7	25.8	30.4	24.2	30.2	23.8	29.5	25	30.6	23.4
18	31		30.2	22.6	33.7	22	29.7	25.4	31	25.1	30.5	22.6	29.8	24.2	31	23.4
19	31	24.8	30	22.8	32.6	21.1	29.5	25.7	31.2	23.8	27.3	22.7	28.8	24.5	31.5	24.4
20	29.7	24.5	27.5	22.8	32.7	21.3	29.7	25.5	30.2	23	29.4	23.2	29.5	24	30.3	22.8
21	29	23.8		22.6	31.4	21	30.2	25.6	29.7	23.6	28.6	23.7	28.4	25.2	29.8	23.3
22	28.4	23.6		23	33.2	22.5	30.1	25.8	30.2	22.8	29.9	22.5	31.2	25	31	23.9
23	29.3	22.8		23	32.8	22.9	30.1	25.7	28.7	24.4	29.3	23	30.2	24	31.7	23.2
24	29.2	22		23.1	32.3	20.6	30.2	25.4	29.4	23.5	29	22.6	27.4	24	29.5	23.5
25	30.9	22.8			31.3	22	29.5	25.5	29.8	25.4	30.1	24	28.2	25.5	29.4	23.4
26	31.2	23.5			31.3	22.7	31	23.1	30	25.8	30.5	22.5	28.5	25.4	30.8	23.8
27	30.9	23.9		24	30.7	23	29.3	24.8	30.9	25.6	30.6	22.8	29.5	25.5	30.5	23
28	31.6	23.3		23.6	32.3	23.5	29	25.4	29.7	25	29.9	23.5	30.4	24.8	31.2	23
29	30.1	23.3		23.3	31.7	21.1	28.9	24.9	30.4	24.3	30	23.4	29.5	24.8	30.3	22.8
30	29.5	24.5		23.2	31.4	22.3	30	25.6	30.5	23.4	29.4	23.4	27.5	24.6	28.3	23.3
31	30.8	23.4		22.6	30.7	22.4	28.9	25.1	29.9	23.1	29.2	21.5	28.8	24	31	22.5
Mean	30.4	24.1	30.2	22.9	32.9	21.9	29.9	25.5	30.2	24.3	29.8	22.9	29.9	24.7	31	23.4



Maximum and minimum temperatures for third-class and rain stations, December, 1913—Continued.

Day.	Batag.		Gubat.		Sumay, Guam.		Calapan.		Virac.		Nueva Caceres.		Batangas.		Silang.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	29.9	22.9	-----	22.7	30	25.8	28	21.6	30.2	20.9	30	20	81	21.1	30.3	19.7
2	29.8	22.2	-----	21.8	29.4	23.6	31	19.5	31.4	19.6	30	18.2	30.5	20	30.8	19.9
3	29.8	22.7	-----	23.2	30.2	23.4	29.5	20.1	30.5	20.3	31	17.4	31.2	19.4	31.5	19.5
4	28.9	23	-----	25.2	28.2	23	30	21.1	31.6	20.7	31.4	18.4	32.4	20.8	31.7	19.1
5	29.4	23.7	-----	25.1	28	25.4	28.5	22.5	29.8	-----	31.3	18.5	30.2	20.9	29	18.6
6	28.9	23.5	-----	25.5	28	24	29.8	23.7	31.5	20.9	32.2	17.2	31.8	21.3	28.3	18.2
7	29	22.9	-----	24.1	29	24	29.2	22.5	31.4	-----	31.6	18.7	31.8	21.2	28.8	18.4
8	28.9	21.6	-----	23.6	28.4	23.8	30	23	30	-----	31.8	20	32.4	21.6	29.6	19.5
9	27	22.1	-----	24.2	29.4	24.4	29.5	22.6	29.9	-----	31.5	18.6	29.8	23	30.1	19.7
10	29	22.1	-----	23.5	28.4	24.8	29.5	24.5	29.8	-----	31.6	19.4	31.9	22.3	28.2	18.7
11	28.9	22.1	-----	22.6	28.6	25	29	23.3	31.5	-----	31.9	20.4	32.4	22	28	18.8
12	29.5	21.8?	-----	23.3	29	25	29.3?	22.6	31	20.6	31	21	33.8	22	27.8	19
13	29.4	22.9	-----	24.8	29.2	25.4	30.5	24.1	29	-----	30.8	20.4	33.1	22.8	28.8	18.6
14	28.6	21.8	-----	24	27.8	25.2	27	23	27.7	-----	26.7	21.8	30.2	21.5	28.2	18.3
15	28.4	23.2	-----	25	28.4	24.2	-----	23.2	30.8	22	31.8	20	32.5	23.6	28.9	18.1
16	29	22.5	-----	24.6	29	25.4	28.5	23	31	22.2	31.5	21.4	33.3	23.5	29.3	18.6
17	28.5	22	-----	23.6	29.2	23.6	26.5	22.1	26.5	21.9	24.6	21.7	30.8	21.2	30	18
18	29.5	23	-----	22.8	26.2	24	26	22.6	28	21	28.7	21.2	27	22.4	29.4	18.4
19	27	22	-----	23.1	28.6	24	26.5	23.5	28.4	21.7	28.7	21.4	30.7	22.5	29	18.7
20	28.5	22.2	-----	23.6	28.4	24.6	28.5	23	29.1	22	30.1	21.2	30.3	22.5	29.6	18.2
21	26.7	22	-----	24.2	28.6	23.6	29.8	22.8	28.3	22.7	31.7	19.4	32.4	21.8	28.5	18.8
22	27.5	22.1	-----	24	28.4	25.4	29.6	22.1	28	22.6	30.1	22.2	31.3	21.8	29.8	19.4
23	27.5	22.2	-----	23.4	29.4	25.4	29.5	22.7	30.2	20.4	29.9	21.4	28.8	23.7	30.5	19.1
24	27	21.4	-----	23	28.4	24.8	28.8	22	27.8	21.4	29.5	21.7	31.8	22.4	30.1	19.5
25	27.2	23.2	-----	23.5	28	24.6	29.2	22	30.6	22.4	28.8	22.2	29.9	22	30.7	19.8
26	29.9	22	-----	24	29	24.8	28.8	22	29.9	23	29.3	22	30.7	21	30.9	19.2
27	29.5	23	-----	24.1	29	24	29	22.8?	30.8	22.5	29.3	22	30.8	23.1	29.9	19
28	28.9	23	-----	23.3	29	21.2	28.2	23	29.6	20.9	29.7	22.1	29.4	22.3	29.6	19.4
29	25.9	22.3	-----	22.8	28	21.8	29.5	22.6	26.5	21.5	27.9	19.2	31.7	20	30.2	18.7
30	28	22.5	-----	23.3	28	23.4	26	23.6	27.7	22.2	24.1	20	28.4	22.5	29.9	18.4
31	27	21.3	-----	22.3	28.6	24.2	27	22	28.2	20.8	28.3	19.4	27.8	21.2	29.5	18.8
Mean	28.5	22.4	-----	23.7	28.6	24.3	28.7	22.6	29.6	21.5	29.9	20.3	31	21.9	29.6	18.9

Day.	Sta. Cruz, Laguna.		Antipolo.		Iba.		Tarlac.		Baler.		San Fernan- do, Union.		Echagüe.		Candon.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
1	30.5	22.2	32.4	20.2	31.4	20.4	34.5	20.7	30.4	20.7	31.1	21.5	30.8	20.1	29.9	22.6
2	30.6	21.2	31	20.4	31	18.5	33.4	20.4	33	19.2	32.9	20.7	30.3	19.6	29.5	21
3	30.3	20.1	32.1	19	31.4	18.9	32.8	21	30.5	20	33.1	20.8	31.5	21.9	29.9	23
4	29.9	21.1	31.4	19.7	32.3	19	33.2	20.5	29.5	19.4	32.6	21.4	26.5	22	29.6	23.5
5	27.4	21	28.8	20.4	31.4	20.5	32	22	27.9	21	30.5	21.4	24.6	19.2	30.9	21.6
6	28.5	21.8	30.8	19.2	31.5	22.1	32	19.3	29.8	20.3	31.6	20.8	24.8	19.1	29.9	21.4
7	29.5	22.5	30.7	19.8	31.9	20	32	20.8	32.2	22.1	31.9	21.9	27.8	20.7	30.2	22.2
8	28.9	22.5	30.1	21.3	31.4	20.5	31.8	19.8	27.8	22.7	32.2	21.1	27.8	19.9	29.7	21.5
9	28.2	22.5	30.2	22.8	32.4	21	31.6	20.5	29	22.3	33.2	21.1	28.2	20.8	30.8	22
10	29.5	23	30.6	19.6	32	20.5	33.4	21.5	31.9	21.7	32.4	20.1	26.8	20.4	29.9	21.2
11	30.3	22.8	31.3	21	34	19.5	32.9	19.9	27	21	32.4	19.6	26.3	20.4	29.9	21
12	30	23	32.6	21.5	33.9	19.4	33.8	21.5	32.5	21.9	32.5	20.6	30.4	21.7	30.4	20.9
13	29.8	23.2	32.1	21.7	32.5	20	31.9	19.8	29.2	23.2	33.2	20.6	25.6	22.3	29.6	21
14	28.5	23.5	31.2	20.3	31	22.5	31.8	20.6	32.8	22	32.3	22.6	27.6?	20.3	30.9	22.1
15	28.5	23.5	31.4	20.8	32	22.4	33.2	22.3	28.6	22.7	32.3	20.3	28.2	20.3	30.8	20.7
16	30.2	23.5	32.3	22.3	31.4	21.5	31.4	21.8	29	23.6	32.9	23.3	30.1	22.2	30.9	23.5
17	29	22.6	31.4	19.9	31.4	20.1	31.8	20	30	21.2	33.2	22.6	26.9	21	31.6	23
18	26	23	25.5	21.3	30.9	22.9	32	21.5	28.9	23	33.1	23.1	23.9	19.8	30.9	23.5
19	27.3	22.6	30.2	20.8	33.1	22.1	31.4	21.5	27.6	22	32.6	22.2	27.1	19.3	29.9	22.5
20	28.4	22.4	30	21.4	30.9	21.5	31.5	20.5	28.5	23	32.4	22.2	28.3	19.5	30.5	22.6
21	29	22.2	31.2	20.3	32	20.8	30.8	19.8	31	21.3	32	22.1	31.9	20.6	30.6	23.5
22	30.4	22.3	32.1	21.1	32.2	20	32	21.8	30.2	20.3	32.6	21.4	31	18.8	30.5	23
23	28	23.2	30	21.3	33	19.9	32.7	22.6	31.2	21.4	32.8	22.4	28.8	21.7	30.9	23
24	28.7	22.6	29.2	21.2	31	20.8	33.3	21	31.5	21.5	31.5	22.2	27.7	20.8	31.5	23
25	28.6	22.6	29.6	20.7	30.5	20	31.8	20.5	31.4	21.7	32.2	21.7	25.9	20.8	30.4	23
26	30.7	21.8	31.3	21.5	30.3	20.7	32	20	33.3	21.4	33.1	22	30.1	20.8	29.9	22.9
27	28.9	21.8	30.3	20.3	31.2	18	32.7	23	31.2	21.7	30.2	21.9	26.9	20.6	28.4	20.5
28	28	22.3	28.8	20.3	29	18	30.5	22	28.5	23.2	29.6	20.5	27.5	19.8	28.2	20.2
29	29.1	21.3	30.7	19.5	30.6	17.8	31.6	21.8	26.7	21.4	30.8	19.2	26.3	19.1	28.6	20
30	26.5	22.5	27.6	21.3	30.8	20.8	31.8	21.8	26.6	21.3	32.3	19.2	26.1	20.4	30.4	22.5
31	26.9	21.5	30.3	20.2	31.5	22	31.5	19.8	28.7	22.5	31.6	19.1	23.4	19.2	29.9	23.6
Mean	28.9	22.3	30.6	20.7	31.6	20.4	32.2	21	29.9	21.6	32.2	21.3	27.7	20.4	30.2	22.1

Maximum and minimum temperatures for third-class and rain stations, December, 1913—Continued.

Day.	Laoag.		Santo Domingo, Batanes.		Day.	Laoag.		Santo Domingo, Batanes.	
	Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.	Maxi- mum.	Mini- mum.
	°C.	°C.	°C.	°C.		°C.	°C.	°C.	°C.
1.....	30.4	19.7	25.6	20.4	18.....	32.6	22.9	21.9	17.9
2.....	32.5	17.4	25.9	21.1	19.....	34.7	20	23.6	18.2
3.....	31.6	19.1	23.9	20.4	20.....	32.8	18.9	26.4	19.8
4.....	28.7	22.6	23.5	18.9	21.....	32	21.6	27.8	22.2
5.....	30.9	22.3	21.8	19	22.....	32.1	20.5	27.5	22.5
6.....	32.6	19.5	22.1	17.5	23.....	32.6	21.1	23.1	20.8
7.....	30	22.6	23	19	24.....	32.2	22.6	24.8	20
8.....	34.4	20.8	23.4	19.6	25.....	33.8	20.5	25.5	20.7
9.....	34.5	18.6	26.6	20.6	26.....	32.7	20.4	26.8	21.8
10.....	34.7	18.5	26.4	20.7	27.....	27.5	20.2	23.7	20.6
11.....	33.1	18.9	27.4	22.2	28.....	32.4	17.3	21.5	18.1
12.....	33.4	21	28.9	23.6	29.....	34.1	16.4	24.5	18.1
13.....	36.3	20.7	29	22.8	30.....	33	19.2	25.9	21.7
14.....	35	21.6	26.6	21.9	31.....	31.8	22	22	15.8
15.....	33.4	18.6	28	22.4					
16.....	32.8	22	25.8	21.5	Mean .....	32.6	20.4	25.1	20.3
17.....	32.5	24.2	23.9	18.4					

## SEISMOLOGICAL BULLETIN FOR DECEMBER, 1913.

By the Rev. MIGUEL SADERRA MASÓ, S. J.,  
*Assistant Director of the Weather Bureau.*

### EARTHQUAKES FELT IN THE PHILIPPINES.<sup>1</sup>

3, 10<sup>h</sup> 35<sup>m</sup> [3, 18<sup>h</sup> 35<sup>m</sup>]. Cotabato (SW of Mindanao). Oscillatory earthquake, direction SE-NW, intensity IV, duration 10 seconds. Accompanied by subterranean noises.

4, 14<sup>h</sup> 25<sup>m</sup> [4, 23<sup>h</sup> 55<sup>m</sup>]. Yap (Western Carolines). Earthquake of intensity V, duration eight seconds. Two series of oscillations were noted: E-W and ESE-WNW. Preceded by subterranean noises.

12, 2<sup>h</sup> 15<sup>m</sup> [12, 10<sup>h</sup> 15<sup>m</sup>]. Butuan (N of Mindanao). Oscillatory earthquake direction N-S, intensity III, duration very short.

12, 8<sup>h</sup> 10<sup>m</sup> [12, 16<sup>h</sup> 10<sup>m</sup>]. Cebu. Subsultory earthquake, intensity III.

14, 4<sup>h</sup> 03<sup>m</sup> [14, 12<sup>h</sup> 03<sup>m</sup>]. Butuan (N of Mindanao). Earthquake of intensity II-III.

17, 1<sup>h</sup> 15<sup>m</sup> [17, 9<sup>h</sup> 55<sup>m</sup>]. Calbayog (NW of Samar). Oscillatory earthquake of intensity III, duration very short.

18, 18<sup>h</sup> 00<sup>m</sup> [19, 2<sup>h</sup> 00<sup>m</sup>]. Butuan (N of Mindanao). Oscillatory earthquake direction N-S, intensity IV-V, duration six seconds. The epicenter of this and the precedent earthquakes in Butuan was probably in the Bay of the same name.

19, 0<sup>h</sup> 05<sup>m</sup> [19, 9<sup>h</sup> 35<sup>m</sup>]. Yap (Western Carolines). Earthquake of intensity III, duration two seconds.

20, 3<sup>h</sup> 16<sup>m</sup> [20, 11<sup>h</sup> 16<sup>m</sup>]. Butuan (N of Mindanao). Oscillatory earthquake, direction NNE-SSW, intensity IV, duration four seconds.

21, 19<sup>h</sup> 40<sup>m</sup> [22, 3<sup>h</sup> 40<sup>m</sup>]. Butuan (N of Mindanao). Subsultory and oscillatory earthquake, intensity III, short duration.

<sup>1</sup> The intensity of earthquakes is given in the notation known as the Rossi-Forel scale. The time is that indicated by the seismographs at the Central Observatory whenever the disturbance has been registered by them. This fact is denoted by an asterisk (\*). Otherwise the time is that noted by the observers who sent the report. All time indications are in Greenwich mean time (Midnight=0<sup>h</sup>), insular time being added for the convenience of Philippine readers.

## RECORDS OF THE MICROSEISMOGRAPH.

[Time: Mean Greenwich. Midnight=0<sup>h</sup>. Instrument: Wiechert seismograph; 1,000 kilograms.  $A_N$ :  $T_0=6.4$ ,  $\epsilon=2.21$ ,  $\frac{r}{T_0^2}=0.081$ ;  
 $A_E$ :  $T_0=6.5$ ,  $\epsilon=3.79$ ,  $\frac{r}{T_0^2}=0.024$ . Alluvium. 2.40 meters above sea level.]

No.	Date.	Character.	Phase.	Hour.	Period.	Amplitude.		Remarks.
						$A_N$ $\mu$	$A_E$ $\mu$	
366	1	Iv	eP	<i>h. m. s.</i>				
			L	23 14 14				
			M <sub>E</sub>	14 48				
			F	14 51	0.5		59	
367	3	Ir	eP	8 05 30				
			eS	08 34				
			eL	11 23				
			M <sub>E</sub>	12 26	8		18	
368	7	Iv	F	36				
			eP	12 03 02				
			L	03 20				
			M <sub>E</sub>	03 29	1		67	
369	21	IIr	F	08				
			eP	15 42 33				From the Horizontal Pendulums. From 15th to end of this month the Wiechert seismograph was being transferred to another locality.
			eS	46 23				
			eL	49 07				
370	21	I	M <sub>E</sub>	51 58	10		1,200	
			M <sub>N</sub>	52 07	10	1,667		
			F	16 55				
			e	17 08 50				From the Horizontal Pendulums.
371	30	Iv	M <sub>E</sub>	15 18	14		27	
			M <sub>N</sub>	17 22	13	40		
			F	43				
			eP	3 21 18				From the Vicentini.
			L	21 31				
			M <sub>E</sub>	21 38	0.5		235	
			M <sub>N</sub>	22 06	0.5	150		
			F	27				

TEMBLORES DE TIERRA SENTIDOS EN FILIPINAS.<sup>1</sup>

3, 10<sup>h</sup> 35<sup>m</sup> [3, 18<sup>h</sup> 35<sup>m</sup>]. Cotabato (SW de Mindanao). Temblor oscilatorio, dirección SE-NW, intensidad IV, duración 10 segundos. Acompañado de ruido subterráneo.

4, 14<sup>h</sup> 25<sup>m</sup> [4, 23<sup>h</sup> 55<sup>m</sup>]. Yap (Carolinas Occidentales). Temblor de tierra de intensidad V, duración 8 segundos. Notáronse dos series de oscilaciones: E-W y ESE-WNW. Precedió a los choques ruido subterráneo.

12, 2<sup>h</sup> 15<sup>m</sup> [12, 10<sup>h</sup> 15<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección N-S, intensidad III, duración muy corta.

12, 8<sup>h</sup> 10<sup>m</sup> [12, 16<sup>h</sup> 10<sup>m</sup>]. Cebú. Temblor de tierra susultorio, intensidad III.

14, 4<sup>h</sup> 03<sup>m</sup> [14, 12<sup>h</sup> 03<sup>m</sup>]. Butuan (N de Mindanao). Temblor de tierra de intensidad II-III.

17, 1<sup>h</sup> 15<sup>m</sup> [17, 9<sup>h</sup> 55<sup>m</sup>]. Calbayog (NW de Sámar). Temblor oscilatorio de intensidad III, duración cortísima.

18, 18<sup>h</sup> 00<sup>m</sup> [19, 2<sup>h</sup> 00<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección N-S, intensidad IV-V, duración 6 segundos. El epicentro de éste y de los precedentes temblores probablemente se hallaba en la bahía del mismo nombre.

19, 0<sup>h</sup> 05<sup>m</sup> [19, 9<sup>h</sup> 35<sup>m</sup>]. Yap (Carolinas Occidentales). Temblor de tierra de intensidad III, duración 2 segundos.

20, 3<sup>h</sup> 16<sup>m</sup> [20, 11<sup>h</sup> 16<sup>m</sup>]. Butuan (N de Mindanao). Temblor oscilatorio, dirección NNE-SSW, intensidad IV, duración 4 segundos.

21, 19<sup>h</sup> 40<sup>m</sup> [22, 3<sup>h</sup> 40<sup>m</sup>]. Butuan (N de Mindanao). Temblor de tierra susultorio y oscilatorio, intensidad III, duración corta.

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<sup>1</sup> La intensidad de los terremotos se indica conforme a la conocida escala de De Rossi-Forel. Cuanto a la hora de su ocurrencia, adoptamos la indicada por los seismógrafos de este Observatorio siempre que los hayan registrado, distinguiéndola por medio de un asterisco (\*). En caso contrario copiamos la apuntada por los observadores que nos envían las notas. Todas las indicaciones del tiempo se refieren al tiempo medio de Greenwich (medianoche=0<sup>h</sup>). Para conveniencia de los lectores de Filipinas se añade también el tiempo insular.



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**APPENDIX TO THE MONTHLY  
BULLETINS FOR 1913.**

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# ANNUAL SUMMARY OF METEOROLOGICAL DATA FOR MANILA DEDUCED FROM TWENTY-FOUR DAILY OBSERVATIONS DURING THE YEAR 1913.

Month.	Pressure.		Air temperature.									
	Mean.	Departure from normal.	Mean.	Departure from normal.	Mean maximum.	Departure from normal.	Mean minimum.	Departure from normal.	Absolute maximum.	Day.	Absolute minimum.	Day.
	mm.	mm.	°C.	°C.	°C.	°C.	°C.	°C.	°C.		°C.	
January	761.67	+0.85	24.7	-0.2	30.1	0	21.1	+0.7	31.5	15, 22	18.6	29, 30
February	61.42	+ .13	25	- .3	31.6	+ .8	20	- .3	33.4	16	17.8	25
March	59.59	- .92	26.5	- .1	33.4	+1	21	- .3	35.2	18	18.9	3
April	59.07	- .31	27.1	-1	33.9	+ .1	21.8	- .9	35.2	10, 14	17.2	2
May	58.27	- .10	27.4	-1	33.4	- .1	23.3	- .6	35.4	18, 28	20	22
June	58.65	+ .68	27.8	- .1	34.2	+1.8	23.7	- .2	36.5	4	22.6	1
July	56.26	- .99	26.5	- .5	30.9	0	23.8	+ .1	34.8	1	22.8	27
August	56.93	- .39	26.3	- .7	30.9	+ .2	23.7	0	32.9	18	22.3	30
September	57.67	+ .22	26.7	- .2	31.3	+ .7	23.6	0	33	22, 23, 30	21.2	29
October	58.51	- .14	26.1	- .6	31.4	+ .3	22.6	- .5	33.5	2	19.5	26
November	61.04	+1.62	25.1	- .8	30.7	+ .4	21.4	- .8	33.7	9	18.1	15
December	61.32	+ .83	25	- .1	30.7	+ .8	21.3	+ .1	33.2	12	19.8	4
Annual	759.20	+0.10	26.2	-0.5	31.9	+0.5	22.3	-0.2	36.5	VI, 4	17.2	IV, 2

Month.	Wind.				Relative humidity		Vapor pressure.		Cloudiness.	
	Prevailing direction.	Velocity.			Mean.	Departure from normal.	Mean.	Departure from normal.	Mean.	Departure from normal.
		Total.	Departure from normal.	Hourly maximum.	Direction at the time of the maximum velocity.					
January	NE quad.	Km. 3,363.5	-1,774.0	21	NNE, ENE	P. ct. 82.7	+4.6	mm. 19.0	+0.8	0-10. 6.8
February	SE quad.	4,868	-526.4	30	SE	74	+ .1	17.2	- .3	6.6
March	SE	5,823.5	-1,037.1	30	SE	70.4	-1.2	17.8	- .4	5.2
April	SE	6,007.5	-984.4	29	ESE, SE	70	+ .3	18.4	-1	5.3
May	SE, and sw quad.	6,001.5	-880.9	34	NNE	77.4	+1.3	20.8	- .9	6.1
June	SE	5,690.5	-1,125.1	29	SWbyW	79.9	-1	21.9	- .5	6.7
July	WSW	10,374	+1,862.7	69	SW	86.6	+1.8	22.1	- .3	8.7
August	SW	8,843.5	-160	46	SW	87	+2	22.1	- .3	8.5
September	SW quad.	8,664.5	+422.5	50	SW	85.4	- .2	22.1	- .3	7.4
October	SW quad.	4,152	-1,182.2	50	SWbyW	83.4	- .2	20.8	- .9	6.5
November	NE quad.	3,667.5	-1,156	29	NE	81.7	- .7	19.2	-1.1	6.8
December	NE quad.	4,021	-724.6	26.5	NE	80.9	- .2	18.9	- .3	7.1
Annual		71,477.0	-7,265.5	69		80.0	+0.6	20.0	-0.5	6.8

Month.	Evaporation.		Sunshine.		Rainfall.					
	Free exposure, total.	Under shelter, total.	Total.	Departure from normal.	Total.	Departure from normal.	Greatest in a single day.	Day.	Rainy days.	Departure from normal.
	mm.	mm.	h. m.	h. m.	mm.	mm.	mm.			
January	78.7	65.5	140 30	- 51 24	65	+ 37.2	33.3	1	10	+ 5
February	120.2	94.9	171 10	- 27 43	0	- 10.5	0	0	0	- 3
March	175.9	133.3	223 15	- 5 12	15.8	- 2.6	12.2	5	4	+ 1
April	170.5	129.8	238 25	- 24 01	130.4	+ 96.2	48.3	14	5	+ 1
May	134.6	102.5	200 30	- 31 16	40.5	- 68.7	9.8	8	9	- 1
June	123	91.3	185 10	+ 10 57	195.8	- 37.3	41.7	12	14	- 2
July	67.6	62	85 40	- 61 06	570.6	+168.6	83.7	20	26	+ 5
August	66.7	57.9	102 45	- 39 09	349.1	- 9.9	56.1	1	28	+ 7
September	77.4	65.2	133 55	- 2 52	365.5	+ 5.7	128.2	10	20	0
October	87.4	68.6	191 30	+ 21 18	119.7	- 67.5	48.5	14	13	- 3
November	82.3	68.3	139 35	- 21 54	31.1	- 97.8	6.7	20	12	0
December	90.8	72.9	130 35	- 27 02	37.8	- 22.1	12.2	18	12	+ 3
Annual	1,275.1	1,012.2	1,943 00	-259 24	1,921.3	- 8.7	128.2	IX, 10	153	+13

# CATALOGUE OF PHILIPPINE EARTHQUAKES, 1913.\*

Date.	Time of occurrence (Greenwich mean time).	Place.	Probable origin or epicenter.		Approximate extensions of the shaken area.		Intensity (Rossi-Forel).	Remarks.
			$\phi$	$\lambda$	Longer axis.	Shorter axis.		
	<i>h. m.</i>		$^{\circ}$	$^{\circ}$	<i>Km.</i>	<i>Km.</i>		
Jan.	4	22 31	16.4 N	120.7 E			III	
	7	15 27	16.4 N	120.7 E			III	
	9	8 30					III	
	10	10 28					III	
	13	12 16	12.6 N	125.0 E			III	Registered at Manila.
	15	11 46					III	Do.
	16	23 45	15.1 N	119.6 E	280	150	V	Registered at Manila and Baguio.
	26	8 15					III	Registered at Manila.
	29	1 45					III	
Feb.	1	15 57					III	
	3	2 26					V-VI	Do.
	5	20 56	9.7 N	126.3 E	400	250	III	
	5	21 30					III	
	12	0 10					III	
	12	20 10					III	
	15	18 00					III-IV	
	17	4 51	8.0 N	127.0 E	500	300	III-IV	Aftershock, III at 18h 30m.
	17	22 59					IV	Registered at Manila and Batavia.
	18	11 10					III	Registered at Manila.
	20	19 10	7.0 N	125.7 E	300	150	IV	
	21	0 50					III	
	24	4 31					III	
	24	18 25					III	
	25	4 50					III	
	26	0 45					III	
	26	17 40					III	
	27	1 19	8.6 N	125.6 E	200	100	V	Do.
Mar.	1	14 30	13.3 N	144.7 E			III	Registered in the Far East and Europe.
	3	0 30					III	
	3	7 15					IV	
	11	0 40					III	
	12	9 47					IV	
	12	16 40					III	
	14	1 00					IV	
	14	8 00					IV	
	14	8 47	5.0 N	127.0 E	700	550	VIII-IX	Registered all over the world. Numerous aftershocks of intensity III-V till 27th.
	15	7 50					IV	
	16	6 18	5.0 N	127.0 E			V	Registered at Manila.
	17	0 53	9.5 N	125.5 E	450	300	V	Registered in the Far East.
	17	2 13	13.5 N	123.4 E	200	120	IV	Registered at Manila.
	17	6 15					IV	
	18	14 11					III	
	21	2 43	13.0 N	123.8 E			III	Do.
	21	3 16	5.0 N	127.0 E			IV-V	
	21	21 50	16.2 N	120.3 E			IV	Do.
	23	21 09					III	
	24	4 50					III	
	25	9 50	7.0 N	124.4 E			IV	
	27	1 40					III	
	27	12 51	7.7 N	123.4 E	300	300	V	Do.
	29	17 53	7.7 N	123.4 E	300	300	IV	Do.
	29	18 57					III	Do.
Apr.	17	12 32	9.5 N	126.4 E	550	400	VII	Registered in the Far East and Europe.
	17	21 49	16.2 N	120.3 E			III	Registered at Manila.
	18	13 15	9.5 N	126.4 E	550	400	VIII	Registered all over the world. Followed by a seismic period, lasting until the following month, during which more than a hundred shocks of intensity III-VIII were felt in the north-eastern part of Mindanao.
	18	18 49	18.5 N	122.4 E			IV-V	Registered at Manila and Formosa.
	22	20 52	10.7 N	124.5 E			IV-V	

\* See explanation in Monthly Bulletin of the Weather Bureau for December, 1910, page 445.

## Catalogue of Philippine Earthquakes, 1913—Continued.

Date.	Time of occurrence (Greenwich mean time).		Place.	Probable origin or epicenter.		Approximate extensions of the shaken area.		Intensity (Rossi-Forel).	Remarks.
				$\phi$	$\lambda$	Longer axis.	Shorter axis.		
	<i>h.</i>	<i>m.</i>		$^{\circ}$	$^{\circ}$	<i>Km.</i>	<i>Km.</i>		
May	1	4 20	Maasin (SW of Leyte)					III	
	2	11 45	Northeastern Mindanao	9.0 N	126.4 E			IV	
	3	5 56	Northwestern Luzon	17.5 N	120.3 E	200	90	IV	Registered at Manila.
	3	23 35	Northeastern Mindanao	9.0 N	126.4 E			IV-V	Aftershocks two hours later.
	4	21 10	Nueva Caceres (SE of Luzon)					III	
	6	9 29	Western Luzon	16.2 N	120.3 E	100	80	IV	Registered at Manila.
	7	0 03	Northeastern Mindanao	9.0 N	126.4 E			VI	Registered at Manila. Three aftershocks in the next 50 minutes.
	7	20 04	do	9.0 N	126.4 E			V	Registered at Manila. Preceded and followed by other shocks of less intensity.
	8	17 35	do	9.0 N	126.4 E			IV-V	Registered at Manila.
	14	9 08	Southwestern Luzon	14.2 N	120.4 E	250	120	IV	Do.
	16	12 00	Vigan (NW of Luzon)	17.5 N	120.3 E			IV	Do.
	17	10 28	Northeastern Mindanao	9.0 N	126.4 E			V-VI	Registered at Manila. Aftershock at 13 <sup>h</sup> 05 <sup>m</sup> .
	18	20 55	Butuan (N of Mindanao)					IV	Registered at Manila.
	20	16 45	Northern Luzon	18.1 N	121.0 E			III	Do.
	29	13 30	do	18.1 N	121.0 E	200	200	VI-VII	Registered in the Far East. Aftershock, IV at 20 <sup>h</sup> 25 <sup>m</sup> .
June	1	0 39	Southern Mindoro					III	Registered at Manila.
	1	2 02	Northern Luzon	18.1 N	121.0 E			III	
	8	2 00	Cuyo Island					III	
	8	21 15	Butuan (N of Mindanao)					III	
	10	22 51	Northeastern Mindanao	9.0 N	126.4 E			IV	
	12	2 16	Butuan (N of Mindanao)					III-IV	Do.
	13	7 34	Southeastern Luzon	13.4 N	124.5 E			III-IV	
	17	3 02	Batangas (S of Luzon)					III	Do.
	17	11 13	Butuan (N of Mindanao)					III	Repeated at 21 <sup>h</sup> 25 <sup>m</sup> .
	19	6 20	do					III	
	22	11 26	Northeastern Mindanao	9.0 N	126.4 E			III-IV	Registered at Manila.
	25	9 10	do	9.0 N	126.4 E			IV	
	25	20 20	Butuan (N of Mindanao)					III	
	27	15 08	Iloilo (SE of Panay)	10.8 N	122.3 E			III	Do.
	27	18 14	Cuyo Island					III	
July	2	12 36	Southeastern Luzon	13.1 N	123.8 E			III-IV	Do.
	3	5 00	Surigao (NE of Mindanao)					III	
	9	11 50	Santo Domingo (Batanes Islands)					III	
	11	10 43	Southern Luzon	13.5 N	121.3 E			III	Do.
	12	1 27	Santo Domingo (Batanes Islands)					III	
	20	1 15	Yap (Western Carolines)					III	
	23	12 40	Butuan (N of Mindanao)					III	
	24	10 05	Iba (W of Luzon)	15.0 N	119.8 E			III	Do.
	26	9 24	Aparri (NE of Luzon)					III	
	27	2 52	Butuan (N of Mindanao)					III-IV	
	29	7 06	Tacloban (NE of Leyte)					III	
	29	22 07	Northeastern Mindanao	9.7 N	126.8 E			IV	Registered all over the world.
Aug.	8	3 48	Gubat (SE of Luzon)					III	
	16	16 40	Western Luzon	15.5 N	119.6 E	200	80	III-IV	Registered at Manila.
	22	16 03	Butuan (N of Mindanao)					IV	
	23	2 11	Central Luzon	16.5 N	120.6 E	300	140	VII-VIII	Registered at Manila, Formosa, and Zikawei. Followed by a seismic period lasting until 28th during which 51 shocks of intensity III-VII were felt.
	24	2 20	do	16.5 N	120.6 E	300	140	VI	
	26	0 58	do	16.5 N	120.6 E	300	140	V	
	26	20 03	Butuan (N of Mindanao)					IV	
	26	20 20	Dumaguete (SE of Negros)					IV	
	27	20 57	Central Luzon	16.5 N	120.6 E	300	140	III-IV	
	28	21 19	Batag (NE of Samar)					III	Registered at Manila.
	30	4 05	SE Luzon, Samar and Masbate	12.4 N	123.8 E	250	180	III-IV	Do.
	30	16 30	Butuan (N of Mindanao)					III	
	30	20 16	Davao (SE of Mindanao)					IV	
Sept.	2	8 31	Central Luzon	16.5 N	120.6 E			IV	Registered at Manila. Aftershock at 16 <sup>h</sup> 46 <sup>m</sup> .
	4	11 46	do	16.5 N	120.6 E	300	140	VII	Registered at Manila, Formosa, and Zikawei. Six aftershocks, intensity III-VI, during this day in which the second part of the seismic period above reported began and lasted until the 10th.
	4	15 01	Eastern Visayas and Mindanao	10.5 N	126.4 E	500	200	V	Registered at Manila.
	5	19 52	Central Luzon	16.5 N	120.6 E			VI	Registered at Manila. Preceded by three other shocks, intensity III. Repeated at 23 <sup>h</sup> 29 <sup>m</sup> with intensity V.
	6	11 10	do	16.5 N	120.6 E			IV	Registered at Manila. Repeated at 19 <sup>h</sup> 10 <sup>m</sup> , intensity III.
	7	16 04	do	16.5 N	120.6 E			IV	Registered at Manila. Repeated at 21 <sup>h</sup> 11 <sup>m</sup> , intensity II.

## Catalogue of Philippine Earthquakes, 1913—Continued.

Date.	Time of occurrence (Greenwich mean time).	Place.	Probable origin or epicenter.		Approximate extensions of the shaken area.		Intensity (Rossi-Forel).	Remarks.
			$\phi$	$\lambda$	Longer axis.	Shorter axis.		
	<i>h. m.</i>		$^{\circ}$	$^{\circ}$	<i>Km.</i>	<i>Km.</i>		
Sept. 8	8 38	do	16.5 N	120.6 E			IV	Registered at Manila. After-shock, III at 17 <sup>h</sup> 18 <sup>m</sup> .
9	11 21	do	16.5 N	120.6 E			V	Registered at Manila. Repeated at 19 <sup>h</sup> 08 <sup>m</sup> , intensity IV.
15	12 05	Butuan (N of Mindanao)					III-IV	
24	1 32	Western Luzon	15.9 N	119.6 E			III	Registered at Manila. After-shock at 1 <sup>h</sup> 39 <sup>m</sup> .
29	7 05	E Samar and NE Mindanao	9.5 N	126.4 E	500	200	IV-V	Registered at Manila.
Oct. 2	9 17	Aparri (NE of Luzon)					III	Do.
2	18 32	Butuan (N of Mindanao)					III	
7	2 12	Western Visayas and Mindanao	9.0 N	122.4 E	550	360	VII	Do.
10	13 00	Northern Luzon	17.8 N	121.0 E	180	60	IV	Registered at Manila. After-shock at 14 <sup>h</sup> 47 <sup>m</sup> .
16	16 35	Northeastern Mindanao	9.5 N	125.6 E	250	200	V	After-shock at 19 <sup>h</sup> 35 <sup>m</sup> .
23	10 52	Panay Island	10.8 N	122.3 E	200	200	IV-V	Registered at Manila.
31	23 01	Laoag (NW of Luzon)					III	Do.
Nov. 5	8 25	Ormoc (W of Leyte)	10.7 N	124.5 E			V	
12	5 16	Butuan (N of Mindanao)					IV	
12	9 54	Ormoc (W of Leyte)	10.7 N	124.5 E			V	After-shock at 11 <sup>h</sup> 36 <sup>m</sup> .
12	19 37	Western Luzon	17.5 N	120.3 E	120	60	V	Registered at Manila.
13	7 41	Northern Luzon	17.4 N	120.8 E	300	140	IV	Do.
13	12 57	Ormoc (W of Leyte)	10.7 N	124.5 E			IV	
13	19 55	Borongan (E of Samar)					III	
26	18 57	S Samar and NE Mindanao	10.0 N	126.4 E	400	150	IV	Registered in the Far East.
Dec. 3	10 35	Cotabato (SW of Mindanao)	7.0 N	124.4 E			IV	
4	14 25	Yap (Western Carolines)					V	
12	2 15	Butuan (N of Mindanao)					III	
12	8 10	Cebu (Cebu Island)					III	
14	4 03	Butuan (N of Mindanao)					III	
17	1 55	Calbayog (NW of Samar)					III	
18	18 00	Butuan (N of Mindanao)	9.0 N	125.4 E			IV-V	
19	0 05	Yap (Western Carolines)					III	
20	3 16	Butuan (N of Mindanao)					IV	
21	19 40	do					III	

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DEPARTMENT OF THE INTERIOR

# WEATHER BUREAU

MANILA CENTRAL OBSERVATORY

  
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